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April – June 1990

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INTRODUCTION

The Air Force Office of Scientific Research Technical Report Summaries is published quarterly (March, June, September, and December). It contains a brief summary of each technical report received in the Technical Information Division and submitted to the Defense Technical Information Center (DTIC) for that quarter. Three indexes, subject, personal author and title are provided to help the user locate reports that may be of interest.

AFOSR does not maintain copies of technical reports for distribution. However, you may obtain any of these reports if you are registered with DTIC, by requesting the AO number of that report from the DTIC, Cameron Station, Alexandria, Virginia, 22314.

PURPOSE

The purpose of this report is to inform Air Force Laboratories about the science that the Air Force Office of Scientific Research is supporting.

AFOSR MISSION

The Air Force Office of Scientific Research (AFOSR) is the Single Manager of the Air Force Defense Research Sciences Program (Program Element 61102F) and the primary Air Force agency for the extramural support of fundamental scientific research. The AFOSR is organized under the Air Force Systems Command, DCS/Technology.

AFOSR awards grants and contracts for research in areas of science relevant to the needs of the Air Force. Research is selected for support from proposals received in response to the Broad Agency Announcement originating from scientists investigating problems involving the search for new knowledge and the expansion of scientific principles. Selection is on the basis of scientific potential for improving Air Force operational capabilities, originality, significance to science, the qualification of the principal investigators, and the reasonableness of the proposed budget.
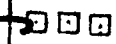
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DTIC Report Bibliography - DTIC's brief description of a technical report.

Search Control Number - A number assigned by DTIC at the time a bibliography is printed.

AD Number - A number assigned to each technical report when received by the DTIC.

Field & Group Numbers - (appearing after the AD number) First number is the subject field, and the second number is the particular group under that subject field.

Corporate Author/Performing Organization - The organization; e.g., college/university, company, etc., at which the research is conducted.

Title - The title of the technical report.

Descriptive Note - Gives the type of report; e.g., final, interim, etc., and the period of the time of the research.

Date - Date of the technical report.

Pages - Total number of pages contained in the technical report.

Personal Author - Person or persons who wrote the report.

Contract/Grant Number - The instrument control number identifying the contracting activity and funding year under which the research is initiated.

Project Number - A number unique to a particular area of science; e.g., 2304 is the project number for mathematics.

Task Number - An alphanumeric number unique to a specific field of the main area of science; e.g., 2304 is the project number for mathematics and A3 is the task number for computational sciences.

Monitor Number - The number assigned to a particular report by the government agency monitoring the research. The number consists of the government monitor acronym, the present calendar year and the technical report assigned consecutively; e.g., AFOSR-TR-83-0001 is the first number used for the first technical report processed for Calendar Year 1983.

Supplementary Note - A variety of statements pertaining to a report. For example, if the report is a journal article, the supplementary note might give you the journal citation, which will include the name of the journal the article it appears in, and the volume number, date, and the page numbers of the journal.

Abstract - A brief summary describing the research of the report.

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 AD-A219959   REPORT DATE: DEC 89   ANNUAL REPORT

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 AD-A221184   REPORT DATE: DEC 89   ANNUAL REPORT

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 AD-A219897   REPORT DATE: DEC 89   ANNUAL REPORT

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 AD-A219957   REPORT DATE: DEC 89   ANNUAL REPORT

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 AD-A221078   REPORT DATE: 89   FINAL REPORT

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 AD-A221564   REPORT DATE: OCT 89   FINAL REPORT

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ABSTRACTS

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SEARCH CONTROL NO. EVK11C

AD-B143 675L   17/6

BIOMAGNETIC TECHNOLOGIES INC SAN DIEGO CA

(U) Large Array Squid Magnetometer for NDE. Phase 1.

DESCRIPTIVE NOTE: Final rept. 1 Aug 89-31 Mar 90,

MAR 90   29P

PERSONAL AUTHORS: Black, William C., Jr.; Hirschkoff,
Eugene C.; Johnson, Richard T.; Marsden, James R.; Wikswo,
John P.

CONTRACT NO.   F49620-89-C-0105

MONITOR: AFOSR
TR-90-0513

UNCLASSIFIED REPORT

Distribution: Further dissemination only as directed by
AFOSR/XOTD, Bolling aFB, Washington, DC 20332-6448, 2 May
90 or higher DoD authority.

DESCRIPTORS: (U)   *MAGNETOMETERS, *SUPERCONDUCTORS,
ALGORITHMS, ARRAYS, BIOMAGNETISM, CRACKS,
CRITICALITY(GENERAL), DATA ACQUISITION, DATA PROCESSING,
DEFECTS(MATERIALS), ELECTRICAL PROPERTIES, ELECTRONICS,
FREQUENCY RESPONSE, HANDLING, INSTRUMENTATION, LOW
FREQUENCY, MEASUREMENT, MODELS, MULTICHANNEL,
NONDESTRUCTIVE TESTING, PATTERNS, PERFORMANCE(ENGINEERING)
, RESOLUTION, SPATIAL DISTRIBUTION, SPECIFICATIONS,
STRUCTURAL PROPERTIES, SUPERCONDUCTIVITY, TARGETS, TIME.

IDENTIFIERS: (U)   SQUID(Superconducting Quantum
Interference Devices).

AD-B142 114L   20/6

MINNESOTA MINING AND MFG CO ST PAUL

(U) Polymer Heterostructure Thin Films.

DESCRIPTIVE NOTE: Final rept. 15 Oct 87-14 Dec 89,

DEC 89   127P

PERSONAL AUTHORS: Egbert, W. C.; Boyd, G. T.; Ender, D. A.
; Field, D. R.; Gerbi, D. J.

CONTRACT NO.   F49620-88-C-0008

PROJECT NO.   D812

TASK NO.   J1

MONITOR: AFOSR
TR-90-0328

UNCLASSIFIED REPORT

Distribution: Further dissemination only as directed by
AFOSR/NC, Building 410, Bolling AFB, DC 20332-6448, 29
Mar 90 or higher DoD authority.

DESCRIPTORS: (U)   *CHARGE TRANSFER, *COMPUTERIZED
SIMULATION, *MACROMOLECULES, *THIN FILMS, COMPUTATIONS,
INTERACTIONS, MODELS, MOLECULE MOLECULE INTERACTIONS,
NONLINEAR SYSTEMS, OPTICAL PROPERTIES, OVERLAP, PHYSICAL
PROPERTIES, POLYMERS, RESPONSE, SPATIAL DISTRIBUTION,
STRUCTURES, SYNTHESIS, THIRD HARMONIC GENERATION.

IDENTIFIERS: (U)   Langmuir Blodgett films, Computational
chemistry, Molecular chains, Pyrene/Poly-Vinyl.

AD-B141 989L   7/8   11/9   11/10

MAXDEM INC PASADENA CA

(U) Preparation of a New Class of Processible, Intrinsically Rigid Polymers.

DESCRIPTIVE NOTE: Final rept. 1 Jul-31 Dec 89,

FEB 90   14P

PERSONAL AUTHORS: Trimmer, Mark S.

CONTRACT NO.   F49620-89-C-0086

PROJECT NO.   3005

TASK NO.   A1

MONITOR: AFOSR
          TR-90-0327

UNCLASSIFIED REPORT

Distribution: Further dissemination only as directed by AFOSR/NC, Bldg. 410, Bolling AFB, DC 20332-6448, 29 Mar 90 or higher DoD authority.

DESCRIPTORS: (U) *POLYMERS, *SYNTHESIS(CHEMISTRY), ELECTRICAL PROPERTIES, ELECTRONICS, MECHANICAL PROPERTIES, MODELS, MOLECULAR STRUCTURE, MOLECULAR WEIGHT, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, OPTICS, REINFORCING MATERIALS, RIGIDITY, THERMAL STABILITY, TRANSITION METALS, TRANSPARENCIES, CATALYSIS, COUPLING(INTERACTION).

IDENTIFIERS: (U) PE65502F, WUAFOSR3005A1, *Rigid rod polymers, Nonlinear optics.

AD-B141 989L

AD-A221 932   9/3

WASHINGTON STATE UNIV   PULLMAN SHOCK DYNAMICS LAB

(U) Nonlinear Material Response to Very Rapid Energy Deposition.

DESCRIPTIVE NOTE: Final 1 Oct 86-31 Dec 89,

MAR 90   38P

PERSONAL AUTHORS: Gupta, Y. M.; Braunlich, P. F.

REPORT NO.   SDL-0142/0149-FTR

CONTRACT NO.   AFOSR-87-0081

PROJECT NO.   3484

TASK NO.   A1

MONITOR: AFOSR
          TR-90-0638

UNCLASSIFIED REPORT

ABSTRACT: (U)   Results of a research effort to examine the nonlinear response of selected materials to rapid energy deposition are summarized. One part of the work focused on examining the response of brittle solids to plane shock waves. The other part of the work focused on understanding the mechanisms for laser energy deposition in transparent dielectrics. The shock wave effort has demonstrated the usefulness of making shear wave measurements for characterizing the shocked state. In fused silica, these measurements led to the finding of reversible, shear enhanced compaction and to a direct determination of stress deviators in the shocked state. The work on polycrystalline calcite represents the first study to use shear wave measurements to understand shock induced phase changes. Shear modulus decrease associated with the calcite transition was observed. The subsequent increase in shear modulus at higher compressions is surprising and, in conjunction with the longitudinal measurements, leads to the possibility that a phase other than calcite III is formed under shock loading. Subject terms: Shear measurements, Phase transitions, Shock waves Lattice stress, Inelastic deformation, Multiple pulse, Laser damage, Transparent materials, Electron heating, Lattice defects. (jes)

AD-A221 932

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 932   CONTINUED

DESCRIPTORS: (U)   BRITTLENESS, CALCITE, COMPACTING,
DEFORMATION, DEPOSITION, DETERMINATION, DIELECTRICS,
ELASTIC PROPERTIES, ELASTIC WAVES, ELECTRONS, ENERGY,
FUSED SILICA, HEATING, LASER DAMAGE, LASERS, LOADS(FORCES)
MATERIALS, MEASUREMENT, NONLINEAR SYSTEMS, PHASE
TRANSFORMATIONS, PLANE WAVES, POLYCRYSTALLINE, PULSES,
RESPONSE, SHEAR PROPERTIES, SHOCK, SHOCK WAVES,
SHOCK(MECHANICS), SOLIDS, STRESSES, TRANSITIONS,
TRANSPARENCE.

IDENTIFIERS: (U)   PE61102F,WUAFOSR3484A1.

AD-A221 931   4/2

PENNSYLVANIA STATE UNIV UNIVERSITY PARK

(U) Integrated Radiometric Profiler for Atmospheric
Humidity and Temperature Measurements.

DESCRIPTIVE NOTE: Final rept.,

APR 90   14P

PERSONAL AUTHORS: Thomson, Dennis W.

CONTRACT NO.   AFOSR-85-0067

MONITOR: AFOSR
TR-90-0639

UNCLASSIFIED REPORT

ABSTRACT: (U)   A 9 channel, integrated radiometer for
recording multi-frequency sky brightness temperatures
from which atmospheric integrated water, and water vapor
and temperature profiles may be estimated has been
designed, constructed and field-tested. The radiometer
includes 3 water-dependent (22.25, 23.9, 31.45 GHz) and 6
oxygen-dependent (50.5, 53.0, 53.6, 54.89, 58.64, 61.03
GHz) frequencies. The radiometer includes 4 Dicke-type
subsystems of 2, 1, 3 and 3 multiplexed frequencies each.
Control and signal processing functions are accomplished
using 8 digital signal processors, 2 per subsystem, which
are in turn controlled by an 80286-equipped host computer.
The basic radiometer package, exclusive of the host
computer and multichannel signal processing chassis, is
about 1/2 x 1/2 x 1 m and is designed for airborne and
shipboard (antenna pedestal) mounting as well as ground-
based overland operation. All system, antenna pointing
control, and signal processing functions are handled
through the host computer. The radiometer may be readily
used in combination with wind profilers, ceilometer,
sodar and other measurement systems as are useful for
improving the precision and spatial resolution of
inverted water and temperature profiles. (rrh)

DESCRIPTORS: (U)   *RADIOMETERS, AIMING, ANTENNA PEDESTALS,
ANTENNAS, CHASSIS, CONTROL, FUNCTIONS, GROUND BASED,
INTEGRATED SYSTEMS, INVERSION, MEASUREMENT, MULTICHANNEL,
OPERATION, PRECISION, PROFILES, RADIOMETRY, RESOLUTION,
SIGNAL PROCESSING, SPATIAL DISTRIBUTION, TEMPERATURE,
WATER, WATER VAPOR.

AD-A221 931

AD-A221 932

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 926   9/5

NEW MEXICO UNIV ALBUQUERQUE CENTER FOR HIGH TECHNOLOGY MATERIALS

(U) Optoelectronics Research Center.

DESCRIPTIVE NOTE: Final rept. 1 Sep 87-31 Dec 88,

   SEP 89   17P

PERSONAL AUTHORS: Brueck, S. R.

CONTRACT NO.   F49620-87-C-0119

MONITOR: AFOSR
            TR-89-1824

            UNCLASSIFIED REPORT

ABSTRACT: (U)   The Optoelectronic Research Center at the University of New Mexico has continued to develop its research capabilities during this reporting period. With partial support from the Air Force Office of Scientific Research, a comprehensive set of facilities for opto-electronics research including materials growth, fabrication science, device development and integration have been established. Allied efforts in laser spectroscopy, in theory and modelling and in manufacturing science provide a uniquely complete environment for important developments in optoelectronics. Specific accomplishments during this period include: development of advanced metal-organic chemical vapor deposition growth of III-V semiconductors; PLZT films for non-linear optical applications; sub-um grating fabrication investigations; development of photolithographic and etching and switching properties of high-power diode lasers. A substantial effort has been devoted to the development of resonant-periodic gain, surface-emitting lasers. (rh)

DESCRIPTORS: (U)   *ELECTROOPTICS, ETCHING, FABRICATION, FACILITIES, GROUP III COMPOUNDS, GROUP V COMPOUNDS, GROWTH(GENERAL), HIGH POWER, LASERS, MANUFACTURING, MATERIALS, NEW MEXICO, NONLINEAR SYSTEMS, OPTICAL PROPERTIES, RESEARCH FACILITIES, SEMICONDUCTOR LASERS, SEMICONDUCTORS, SPECTROSCOPY, SWITCHING.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2301A1.

AD-A221 926

AD-A221 923   20/4

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF APPLIED MECHANICS AND ENGINEERING SCIENCES

(U) Study of the Origin of Three Dimensional Structures in Shear Flows through External Forcing.

DESCRIPTIVE NOTE: Final rept. 15 Sep 87-14 Sep 89,

   MAR 90   23P

PERSONAL AUTHORS: Gharib, M.; Williams, K.

CONTRACT NO.   AFOSR-87-0330

PROJECT NO.   2307

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0483

            UNCLASSIFIED REPORT

ABSTRACT: (U)   Experiments on an externally forced free shear layer are performed which study the origin of three-dimensional structures and chaos in shear flows. Transition routes between the laminar two dimensional stages of shear flows and their final complex three dimensional stages are examined. Two avenues of investigation are pursued. First, the general idea of a multi-frequency route to chaos is examined which treats the shear flow as an open dynamical system. An attempt is made to apply concepts from nonlinear dynamics to these systems Secondly, a new approach to generating three-dimensional structures in shear flows which involves the creation of a spatial shear in the frequency of external perturbations is presented. In these experiments, a variety of vortex reconnection behaviors is observed at the discontinuity. (JHD)

DESCRIPTORS: (U)   *VORTICES, *SHEAR PROPERTIES, DYNAMICS, EXTERNAL, LAMINAR FLOW, LAYERS, NONLINEAR SYSTEMS, PERTURBATIONS, ROUTING, SPATIAL DISTRIBUTION, THREE DIMENSIONAL, TRANSITIONS, TWO DIMENSIONAL.

IDENTIFIERS: (U)   *Shear Flow, Chaos, PE61102F, WUAFOSR2307A2.

AD-A221 923

AD-A221 917   20/11

CALIFORNIA UNIV LOS ANGELES DEPT OF ELECTRICAL
ENGINEERING

(U) Damping Operators in Continuum Models of Flexible
Structures: Explicit Models for Proportional Damping
in Beam Bending with End-Bodies,

90   21P

PERSONAL AUTHORS: Balakrishnan, A. V.

CONTRACT NO.   AFOSR-88-0252

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
TR-90-0629

UNCLASSIFIED REPORT

ABSTRACT: (U)   A convenient working for passive damping
in a flexible structure is proportional damping. Strictly
proportional damping requires that the damping operator
be (essentially) the square root of the stiffness
operator. This reprint presents an explicit calculation
of the square root for the case of the bending of a
uniform Bernoulli beam clamped at one end and subject to
control forces and moments at the other end, and we show
that nonlocal terms are added in the interior as well as
at the ends in contrast to the case where there are no
end-masses and both ends are simply supported. If strict
proportionality is relaxed to require only asymptotic
proportionality, then one can avoid the nonlocal feature
although the boundary equations will still need to
include additional terms. (JHD)

DESCRIPTORS: (U)   *BENDING, *BEAMS(STRUCTURAL), *DAMPING,
*FLEXIBLE STRUCTURES, BOUNDARIES, EQUATIONS, MODELS,
MOMENTS, OPERATORS(MATHEMATICS), PASSIVE SYSTEMS,
REPRINTS, SQUARE ROOTS, STIFFNESS.

IDENTIFIERS: (U)   Bernoulli Beams, PE61102F,
WUAFOSR2304A1.

AD-A221 917

AD-A221 913   3/1

SMITHSONIAN ASTROPHYSICAL OBSERVATORY CAMBRIDGE MA

(U) High Resolution Optical Imaging through the Atmosphere.

DESCRIPTIVE NOTE: Final rept. 1 Feb 86-30 Sep 89,

DEC 89   57P

PERSONAL AUTHORS: Noyes, R. W.; Nisenson, P.; Stachnik, R.
V.; Papaliolios, C.

CONTRACT NO.   AFOSR-86-0103

PROJECT NO.   2311

TASK NO.   A1

MONITOR: AFOSR
TR-90-0603

UNCLASSIFIED REPORT

ABSTRACT: (U)   This program has concentrated on three
major areas: the application of high angular resolution
image reconstruction techniques to the reconstruction of
solar surface features; speckle imaging of a wide range
of astronomical sources; and the implementation of
adaptive optics for faint object imaging. In this project,
we have made substantial modifications to a technique for
reconstruction of high resolution images from single
short exposure solar frames, blind iterative
deconvolution (IDC). We have been testing these
improvements using numerical simulation data. Analysis of
speckle data of the supernova SN1987A has detected a new
bright source, 0.9 arcseconds south of the SN, as well as
substantial structure in the region surrounding the SN.
We also have new results on several Young Stellar Objects
and supergiants. In the area of adaptive optics, an AOA
wavefront sensor has been set up and tested using an
image intensifier which increases its sensitivity by
three orders of magnitude. Faint object image active tilt
correction has also been tested with some important
enhancements, including new highly linear and sensitive
CCD quad cells developed by Cal Tech and Tektronix, and
an off-the-shelf high speed 2-D tilting mirror with
greatly improved specifications. The effects of only
partially correcting atmospheric turbulence have been
theoretically analyzed and numerically simulated. (rh)

AD-A221 913

AD-A221 913   CONTINUED

DESCRIPTORS: (U) *ATMOSPHERIC MOTION, ADAPTIVE SYSTEMS,
ASTRONOMY, BRIGHTNESS, CELLS, DETECTORS, HIGH RESOLUTION,
IMAGE INTENSIFIERS(ELECTRONICS), IMAGES, LOW INTENSITY,
MATHEMATICAL MODELS, NUMERICAL ANALYSIS, OPTICAL IMAGES,
OPTICS, RANGE(EXTREMES), SOURCES, SPECULAR REFLECTION,
STARS, TURBULENCE, WAVEFRONTS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2311A1.

AD-A221 912   7/4

PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

(U) Direct Observation of Adsorbate Dynamics from Low-
Frequency Vibration on a Step Defect-CO on Pt(112),

DEC 89   10P

PERSONAL AUTHORS: Henderson, M. A.; Szabo, A.; Yates, J.
T., Jr

CONTRACT NO.   AFOSR-82-0133

PROJECT NO.   2303

TASK NO.   A2

MONITOR: AFOSR
TR-90-0378

UNCLASSIFIED REPORT

ABSTRACT: (U)   The relative shape of the hindered
translation potential energy well for CO chemisorbed on
the step sites of a Pt(112) single crystal was determined
with digital electron stimulated desorption-ion angular
distribution (ESDIAD). The angular displacement of the CO
molecule in its hindered translation well predominately
determines the half-width at half-maximum (HWHM) of the
neutral CO species produced by ESD, a species which may
be imaged in an ESDIAD apparatus. Variations in the CO
ESDIAD HWHM as a function of temperature are due to
population of higher levels of the hindered translational
mode. By monitoring the CO ESDIAD HWHM for CO coverages
on the step below 50% step saturation (0.17 monolayer) as
a function of temperature, we show that the steepness of
the hindered translation potential well is different for
CO vibrations up, down, and along the step edge,
following the trend: down the steps > up the steps >
along the steps. There is no coverage dependence in the
CO ESDIAD HWHM values up or down the steps, but the HWHM
values along the steps at 0.17 monolayer CO are
significantly broader than those from lower coverages in
the temperature range of 150-350 K. We interpret this to
indicate the production of transient structures of tilted
CO on adjacent step sites formed from preferential

AD-A221 912

AD-A221 912   CONTINUED

diffusion of CO molecules laterally on the step sites.
Thus, the experiments probe directly the anisotropy of
lateral diffusion of the adsorbate on step sites. (JES)

DESCRIPTORS: (U)   *ANISOTROPY, ANGLES, DISPLACEMENT,
EDGES, LOW FREQUENCY, MOLECULES, OBSERVATION, POPULATION,
POTENTIAL ENERGY, PROBES, PRODUCTION, RANGE(EXTREMES),
SHAPE, SITES, STRUCTURES, TEMPERATURE, TRANSIENTS,
TRANSLATIONS, VIBRATION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A2.

AD-A221 911   14/2   20/6   20/4

YALE UNIV NEW HAVEN CT CENTER FOR LASER DIAGNOSTICS

(U) Size and Shape Variations of Liquid Droplets Deduced
from Morphology-Dependent Resonances in Fluorescence
Spectra.

DESCRIPTIVE NOTE: Rept. no. 2 for Jan 85-Feb 86.

85   5P

PERSONAL AUTHORS: Tzeng, H. M.; Long, M. B.; Chang. R. K.;
Barber, P. W.

CONTRACT NO.   F49620-85-K-0002

PROJECT NO.   2308

TASK NO.   A3

MONITOR: AFOSR
TR-90-0406

UNCLASSIFIED REPORT

ABSTRACT: (U)   A new optical technique for determining
the evaporation and condensation rate of flowing liquid
droplets is described. The same technique can also be
used to detect small shape distortions. The method is
based on the precise measurement of resonance peaks in
the fluorescence spectrum. These resonances, which are a
sensitive function of the size, shape, and index of
refraction of dye-impregnated dielectric micro-objects.
have been called morphology-dependent resonances.
Keywords: Size determination; Evaporation rate;
Condensation rate; Shape distortions; Lasing; Liquid
droplets; Microparticles; Surface tension; Bulk viscosity;
Lorenz Mie theory; Morphology dependent resonances;
Reprints. (JHD)

DESCRIPTORS: (U)   *PHASE TRANSFORMATIONS, *LIGHT
SCATTERING, *OPTICAL DETECTION, *MEASUREMENT,
CONDENSATION, DISTORTION, DROPS, EVAPORATION,
FLUORESCENCE, INTERFACIAL TENSION, LIQUIDS, MORPHOLOGY,
OPTICS, PARTICLES, PRECISION, RATES, REFRACTION, REPRINTS,
RESONANCE, SENSITIVITY, SHAPE, SPECTRA.

AD-A221 911

AD-A221 912

AD-A221 910   20/12

MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB OF
ELECTRONICS

(U) Femtosecond Studies of Excited Carrier Energy
     Relaxation and Intervalley Scattering in GaAs and
     AlGaAs.

DESCRIPTIVE NOTE: Final rept.,

MAR 88   10P

PERSONAL AUTHORS: Lin, W. Z.; LaGasse, M. J.; Schoenlein,
R. W.; Zysset, B.; Fujimoto, J. G.

CONTRACT NO.   AFOSR-85-0213

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
           TR-89-0215

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SPIE v942-Ultrafast Laser
Probe Phenomena in Bulk and Microstructure
Semiconductors II, p83-91 1988.

ABSTRACT: (U) We report the investigation of excited
carrier scattering, energy relaxation, and intervalley
scattering in GaAs and AlGaAs. Pump and continuum probe
absorption saturation measurements provide evidence for
femtosecond transient nonthermal carrier distributions
and permit a measurement of carrier cooling processes.
Measurements performed using a tunable femtosecond laser
allow an investigation of intervalley scattering.
Reprints. (rh)

DESCRIPTORS: (U) *SCATTERING, COOLING, ENERGY, LASERS,
RELAXATION, REPRINTS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A1.

AD-A221 910

AD-A221 911   CONTINUED

IDENTIFIERS: (U)   Lorentz Mie Theory, PE61102F,
WUAFOSR2308A3.

AD-A221 911

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 909   7/4

AD-A221 909   CONTINUED

PITTSBURGH UNIV PA SURFACE SCIENCE CENTER

observed by LEED. (JES)

(U) The Structure of CO on the Pt(112) Stepped Surface: A
Sensitive View of Bonding Configurations Using
Electron Stimulated Desorption,

DESCRIPTORS: (U) *DESORPTION, *ELECTRON DIFFRACTION,
ADSORPTION, ANGLES, BONDING, CONFIGURATIONS, DIGITAL
SYSTEMS, ELECTRONS, IMAGES, LOW ENERGY SITES,
STIMULATION(GENERAL), TILT, TRAJECTORIES, TWO DIMENSIONAL.

DEC 89   11P

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A2.

PERSONAL AUTHORS: Henderson, M. A.; Szabo, A.; Yates, J.
T., Jr

CONTRACT NO.   AFOSR-82-0133

PROJECT NO.   2303

TASK NO.   A2

MONITOR: AFOSR
TR-90-0409

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v91
n11 p7245-7254, 1 Dec 89.

ABSTRACT: (U)   The structure of chemisorbed CO on the
steps of Pt(112) Pt(3(111)×(001)) was monitored as a
function of coverage by the digital electron stimulated
desorption-ion angular distribution method (ESDIAD),
digital low-energy electron diffraction (LEED), and
temperature-programmed desorption (TPD). The ESDIAD
method applied to the desorption of an electronically
excited, neutral CO species (the metastable a 3 pi - CO
state) avoids the influence of image potential effects on
the trajectory of desorbing species, yielding true
desorption angles, equivalent to Pt-CO bond orientations.
CO adsorbs exclusively on step sites at low coverage with
a 20 'downstairs' tilt from the (112) direction
(designated 'O'). LEED indicates (2 x n) order (i.e., two-
fold order along the steps but no order up/down the steps)
exists when the steps are half-filled (about 0.19 ML). At
0.24 ML, CO is still adsorbed only on the step sites but
one-dimensional CO-CO repulsions between nearest
neighbors result in CO tilting along the steps. Terrace
CO (+ 13) adsorption is observed above 0.24 ML before all
the step sites fill. All step CO molecules reorient with
new tilt angles up (0) and down (- 38) the steps when the
steps sites saturate (0.53 ML), and (3 x 1) order is

AD-A221 909

AD-A221 909

AD-A221 908   7/4   AD-A221 889   9/5

CALIFORNIA UNIV IRVINE DEPT OF MECHANICAL ENGINEERING   PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF
                                                         CHEMISTRY

(U) Study of Molecular Mixing and a Finite Rate Chemical   (U) A Second-Order Nonlinear Optical
    Reaction in a Mixing Layer.   Poly(organophosphazene),

      88   7P   90   4P

PERSONAL AUTHORS: Cetegen, B. M.; Sirignao, W. A.   PERSONAL AUTHORS: Dembek, Alexa A.; Kim, Chulhee; Allcock,
                                                                            Harry A.

CONTRACT NO.   AFOSR-86-0016   CONTRACT NO.   AFOSR-89-0234

PROJECT NO.   2308   PROJECT NO.   2303

TASK NO.   A2   TASK NO.   B2

MONITOR: AFOSR   MONITOR: AFOSR
           TR-90-0402   TR-90-0625

          UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Symposium (Internation) 22nd   SUPPLEMENTARY NOTE: Pub. in Chemistry of Materials, v2
on Combustion/The Comubstion Institute p489-494 1988.   p97-99 1990.

ABSTRACT: (U)   This paper concerns an analytical study of   ABSTRACT: (U)   Here we report the synthesis and second-
molecular mixing and finite rate chemical reactions in an   order nonlinear response of a polyphosphazene in which
infinite row of two dimensional vortices representing a   nitrostilbene is covalently linked to the polymer chain
mixing layer. Diffusion equations for reacting and non-   through a tris(ethylene oxide) spacer group. Phosphazene
reacting species are solved locally in a Langrangian   macromolecules offer a potential advantage in that the
frame of reference following material elements. The   macroscopic properties of the polymer can be tailored by
concentration distributions in the vortex structure are   the incorporation of specific substituent groups. A
composed from these analytical solutions and presented   polymer described in this paper is, therefore, a
for several cases. The probability density functions   prototype that offers many opportunities for further
(pdfs) constructed from these distributions show   tailoring of the molecular structure to generate an
similarities to those from the mixing layer experiments.   optimum combination of nonlinear optical and physical
Subject terms: Turbulent reacting flow, Mixing in   properties. Phosphazenes, Polymers, Synthesis, NLO
vortical structures. (jes)   materials. Optical materials. (jes)

DESCRIPTORS: (U)   *CHEMICAL REACTIONS, DIFFUSION,   DESCRIPTORS: (U)   *OPTICAL MATERIALS, CHAINS,
EQUATIONS, FLOW FIELDS, LAYERS, MIXING, MOLECULES,   MACROMOLECULES, MOLECULAR STRUCTURE, NONLINEAR SYSTEMS,
PROBABILITY DENSITY FUNCTIONS, RATES, SOLUTIONS(GENERAL), OPTICAL PROPERTIES, OPTIMIZATION, PHOSPHAZENE, POLYMERS,
STRUCTURES, TWO DIMENSIONAL, VORTICES.   SPACERS, SYNTHESIS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A2.   IDENTIFIERS: (U)   WUAFOSR2303B2, PE61102F.

AD-A221 908   AD-A221 889

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 881   20/4   14/4

STANFORD UNIV   CA DEPT OF MECHANICAL ENGINEERING

(U) Digital Fluorescence Imaging of Gaseous Flows.

DESCRIPTIVE NOTE: Symposium proceedings,

     88   12P

PERSONAL AUTHORS: Hanson, Ronald K.; Paul, Phillip H.;
   Seitzman, Jerry M.

CONTRACT NO.   AFOSR-87-0057

PROJECT NO.   2308

TASK NO.   A3

MONITOR: AFOSR
           TR-90-0391

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Materials Research Society
Symposium Proceedings v117 p227-237, 1988.

ABSTRACT: (U)   The current status of Planar Laser-Induced
Fluorescence (PLIF) imaging is reviewed, and example
imaging results obtained in subsonic and super-sonic jet-
mixing flows with a new intensified high-resolution CCD-
array camera are presented. Keywords: Laser; Fluorescence;
Imaging; Supersonic; Subsonic; Jets; Reprints. (jhd)

DESCRIPTORS: (U)   *LASER INDUCED FLUORESCENCE, *JET FLOW,
CAMERAS, CHARGE COUPLED DEVICES, DIGITAL SYSTEMS,
FLUORESCENCE, GAS FLOW, OPTICAL IMAGES, LASERS, PLANAR
STRUCTURES, REPRINTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A3.

AD-A221 881

AD-A221 854   5/7   5/8

OREGON UNIV   EUGENE DEPT OF PSYCHOLOGY

(U) Language Comprehension as Structure Building.

DESCRIPTIVE NOTE: Annual rept.   2 Jan 89-2 Jan 90,

     SEP 90   79P

PERSONAL AUTHORS: Gernsbacher, Morton A.

CONTRACT NO.   AFOSR-89-0258

PROJECT NO.   2313

TASK NO.   A4

MONITOR: AFOSR
           TR-90-0643

UNCLASSIFIED REPORT

ABSTRACT: (U)   This research investigated the role of two
structure building mechanisms in language comprehension.
They are Suppression and Enhancement. The first series of
experiments investigated the role of suppression in word
understanding. The results demonstrated that the
mechanism of suppression dampens the activation of the
inappropriate meanings of ambiguous words; they do not
decrease in activation simply because their activation is
consumed by appropriate meanings or because they decay. A
second series of experiments investigated the role of
suppression in improving the accessibility of concepts
marked by cataphoric devices. Cataphoric devices are
counterparts to anaphoric devices: Anaphoric devices mark
concepts that have been mentioned before, and cataphoric
devices mark concepts that are likely to be mentioned
again. The results demonstrated that when concepts are
marked with cataphoric devices, like spoken stress and
the indefinite this, they are better at suppressing the
activation of other concepts, and they are more resistant
to being suppressed by other concepts. A third series of
experiments investigated the role of suppression and
enhancement in adult comprehension skill. The results
demonstrated that less-skilled comprehenders less-
efficiently suppress the inappropriate meanings of
ambiguous words, the incorrect forms of homophones, the
typical-but-absent members of scenes, and words
superimposed on pictures or pictures surrounding words.

AD-A221 854

AD-A221 844   10/2

CALIFORNIA UNIV BERKELEY DEPT OF ELECTRICAL ENGINEERING
AND COMPUTER SCIENCE

(U) Nonlinear Control of Switching Power Converters.

89   29P

PERSONAL AUTHORS: Sanders, S. R.; Verghese, G. C.;
Cameron, D. E.

CONTRACT NO.   AFOSR-88-0032

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
TR-90-0628

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Control-Theory and Advanced
Technology, v5 n4 p801-627 1989.

ABSTRACT: (U)   Nonlinear control laws for switching power
converters are explored, using an up-down converter as a
vehicle. A nonlinear change of variables is used to
transform the usual state-space description into one that
is more amenable to design of a sliding mode control.
Results of numerical simulations and of a microprocessor
implementation based on look-up tables are presented.
Reprints. (rh)

DESCRIPTORS: (U)   *NONLINEAR SYSTEMS, CONTROL, CONTROL
THEORY, CONVERTERS, MICROPROCESSORS, NUMERICAL ANALYSIS,
POWER, REPRINTS, SLIDING, SWITCHING, VARIABLES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A1.

AD-A221 844

AD-A221 854   CONTINUED
(SDW)

DESCRIPTORS: (U)   *COMPREHENSION, *WORDS(LANGUAGE),
ACCESS, ACTIVATION, ADULTS, LANGUAGE, SKILLS, SPEECH,
STRESSES, SUPPRESSION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2313A4.

AD-A221 854

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 795   20/4

INDIANA UNIV AT BLOOMINGTON DEPT OF MATHEMATICS

(U) Theoretical and Computational Aspects of Turbulence.

DESCRIPTIVE NOTE: Final rept. 1 Jan 88-31 Dec 89,

FEB 90   7P

PERSONAL AUTHORS: Foias, Ciprian I.; Temam, Roger

CONTRACT NO.   AFOSR-88-0103

PROJECT NO.   2304

TASK NO.   A3

MONITOR: AFOSR
TR-90-0484

UNCLASSIFIED REPORT

ABSTRACT: (U)   The computation of turbulent flows
necessitate a better understanding of turbulence and the
development of algorithms and computational tools which
are well adapted to the handling of large numbers of data.
Turbulent flows are due to the superposition of a range
of small and large eddies which interact and the study of
their interaction is an important part of understanding
turbulence. An inertial manifold is an exact (quasi-
static) interaction law between small and large eddies.
In relation with the concept of approximate inertial
manifolds (AIM), Foias-Manley-Temam have shown the
existence of a simple finite-dimensional manifold lying
close to the attractor. By projecting the Navier-Stokes
equations on this manifold we obtain a new numerical
algorithm called the Nonlinear Galerkin Method. This
algorithm is well-adapted to the large time solution of
the Navier-Stokes equations and this has been broadly
confirmed by the numerical tests which has been performed
during this contract. After further tests and studies,
this algorithm will soon be available for industrial
implementations. (jhd)

DESCRIPTORS: (U)   *EDDIES(FLUID MECHANICS), *TURBULENT
FLOW, ALGORITHMS, COMPUTATIONS, INERTIAL SYSTEMS,
INTERACTIONS, NAVIER STOKES EQUATIONS, NUMERICAL ANALYSIS.
NUMERICAL METHODS AND PROCEDURES, SIZES(DIMENSIONS),
SOLUTIONS(GENERAL), TEST AND EVALUATION, TIME, TURBULENCE.

AD-A221 795

AD-A221 827   7/3

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY

(U) Two Myths of Organosilicon Chemistry,

JAN 89   5P

PERSONAL AUTHORS: West, Robert

CONTRACT NO.   AFOSR-89-0004

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0622

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Chemist (Chemical Pioneer
Award Address) p10 Jan 89.

ABSTRACT: (U)   Organosilicon chemistry began in 1860,
when Freidel and Crafts synthesized tetraethylsilane,
(C2H5)4Si, from silicone tetrachloride and diethylzinc.
Progress in this new area was slow through the end of the
1800s and for the first 40 years of this century,
although the classic studies of F.S. Kipping date from
this period. Industrial and scientific interest was
awakened in the 1940s by the discovery and manufacture of
the silicone polymers, leading to what can be called the
first revolution in silicon chemistry. Reprints.
Nonmetals. Polymers. Friedel Crafts reactions.
Polysilanes Photoconductors, Photoresistors,
Microelectronics, Nonlinear optical materials, Free
radicals (jg)

DESCRIPTORS: (U)   *CHEMISTRY *ORGANIC COMPOUNDS,
*SILICON COMPOUNDS, FREE RADICALS, FRIEDEL CRAFTS
REACTIONS, MICROELECTRONICS, NONLINEAR SYSTEMS, NONMETALS,
OPTICAL MATERIALS, PHOTOCONDUCTORS, PHOTORESISTORS,
POLYMERS, POLYSILANES, REPRINTS, SILICON, SILICONE
PLASTICS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2.

AD-A221 827

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 794   12/3

YALE UNIV NEW HAVEN CT DEPT OF ELECTRICAL ENGINEERING

(U) Development and Analysis of ARMA Parameter Estimation
Schemes in the Presence of Noise.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-31 Jan 90,

JAN 90   10P

PERSONAL AUTHORS: Nehorai, Arye

CONTRACT NO.   AFOSR-88-0080

PROJECT NO.   2304

TASK NO.   A6

MONITOR: AFOSR
TR-90-0485

UNCLASSIFIED REPORT

ABSTRACT: (U)   The work done and the number of subjects
studied goes beyond what was promised in the original two-
year proposal. The proposal focused on single-sensor
parameter estimation for ARMA signals in noise. We solved
several open problems in this area and added sine wave
noise. We extended the work to sensor array estimation
algorithms for localization (tracking applications). The
music estimator was developed and compared to the maximum-
likelihood estimator. Closed form expressions for the
Cramer-Rao bound weve discovered for certain cases of
significance also is the thesis of David Starer written
with AFOSR support, that provides up-dating of the roots
of an nth order polynomial in O(u-sq) time, and numerous
applications.

DESCRIPTORS: (U)   *MAXIMUM LIKELIHOOD ESTIMATION,
*NOISE(SOUND), ALGORITHMS, ARRAYS, DETECTORS, ESTIMATES,
MUSIC, PARAMETERS, POLYNOMIALS, SINE WAVES, TRACKING.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A6,
ARMA(Autoregressive Moving Average).

AD-A221 794   PAGE   14   EVK11C

IDENTIFIERS: (U)   Manifolds(Mathematics), PE61102F,
WUAFOSR2304A3.

AD-A221 795

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 793   21/2   20/4

STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING

(U) Turbulent Reacting Flows and Supersonic Combustion.

DESCRIPTIVE NOTE: Final rept. 1 Oct 88-30 Sep 89,

JAN 90   38P

PERSONAL AUTHORS: Bowman, C. T.; Hanson, R. K.; Mugal, M. G.; Reynolds, W. C.

CONTRACT NO.   F49620-88-K-0022

PROJECT NO.   3484

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0504

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U)   An experimental and computational investigation of supersonic combustion flows was carried out. The principal objective of the research was to gain a more fundamental understanding of mixing and chemical reaction in supersonic flows. The research effort comprised three inter-related elements: (1) an experimental study of mixing and combustion in a supersonic plane mixing layer; (2) development of laser-induced fluorescence techniques for time-resolved two-dimensional imaging of species concentration, temperature and velocity; and (3) numerical simulations of compressible reacting flows. The specific objectives and the results of the research is summarized. Keywords: Turbulent reacting flow; Supersonic combustion. (jhd)

DESCRIPTORS: (U)   *REACTION KINETICS, *SUPERSONIC COMBUSTION, CHEMICAL REACTIONS, COMPUTATIONS, OPTICAL IMAGES, LASER INDUCED FLUORESCENCE, LAYERS, MIXING, NUMERICAL ANALYSIS, SUPERSONIC CHARACTERISTICS, SUPERSONIC FLOW, TIME, TWO DIMENSIONAL.

IDENTIFIERS: (U)   PE61103D, WUAFOSR3484A1.

AD-A221 793

AD-A221 792   11/6.2

ROCKWELL INTERNATIONAL   THOUSAND OAKS CA SCIENCE CENTER

(U) Research on Sputtering of Ferroelectric Thin Films.

DESCRIPTIVE NOTE: Final rept. 1 May 86-31 Dec 89.

FEB 90   65P

PERSONAL AUTHORS: Neurgaonkar, R. R.

REPORT NO.   SC5458.FR

CONTRACT NO.   F49620-86-C-0052

PROJECT NO.   2306

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0508

UNCLASSIFIED REPORT

ABSTRACT: (U)   The magnetron sputtering technique has been used to grow morphotropic phase boundary ferroelectric thin films of tungsten bronze PBN:60 and perovskite PLZT. Film crystallinity was found to be strongly influenced by substrate temperature, with temperatures of 500-600 C usually required. Single crystal PBN:60 films were grown on SBN:60 substrates, whereas grain-oriented films were achieved on (100)-oriented Si substrates. PLZT films are grain-oriented for (001)-oriented SBN and have excellent surface quality for guided wave applications. This is the first time such films have been grown on tungsten bronze substrates. Both PBN:60 and PLZT films present a great promise for SLM and electronic memory applications. (rh)

DESCRIPTORS: (U)   *BRONZE, CRYSTALS, ELECTRONIC EQUIPMENT, FERROELECTRIC MATERIALS, FILMS, MAGNETRONS, MEMORY DEVICES, QUALITY, SINGLE CRYSTALS, SPUTTERING, SUBSTRATES, SURFACES, TEMPERATURE, THIN FILMS, TUNGSTEN, WAVEGUIDES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2306B2.

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 767   7/4   3/2   AD-A221 767   CONTINUED

VANDERBILT UNIV NASHVILLE TN DEPT OF PHYSICS AND
ASTRONOMY

(U) Surface Reactions in the Space Environment.

DESCRIPTIVE NOTE: Final rept. 1 Oct 86-30 Sep 89,

MAY 90   26P

PERSONAL AUTHORS: Tolk, Norman H.; Haglund, Richard F.

CONTRACT NO.   F49620-88-C-0125

PROJECT NO.   3484

TASK NO.   A2

MONITOR: AFOSR
           TR-90-0623

UNCLASSIFIED REPORT

DIRECTED ENERGY WEAPONS, ELECTRONIC EQUIPMENT, ELECTRONS,
EROSION, HARDENING, IONS, IRRADIATION, LONG RANGE(TIME),
MATERIALS, MICROSCOPY, PHOTONS, SPACE ENVIRONMENTS,
SURVIVABILITY, VULNERABILITY.

IDENTIFIERS: (U)   PE61103D, WUAFOSR3484A2.

ABSTRACT: (U)   A central goal has been to establish a
multidisciplinary Center of Excellence concentrating on
the atomic-scale dynamics of surface reactions in the
space environment. The major research focus has been the
investigation of the ways in which energy deposited by
incident atoms, ions, electrons and short wavelength
photons is absorbed and localized to produce bond-making
and bond-breaking on surfaces and in the near-surface
bulk. Knowledge of these microscopic mechanisms provides
detailed clues which lead to an understanding of the
macroscopic processes which manifest themselves as
surface erosion, modification and damage. This research
program bears directly on a broad spectrum of questions
germane to the long-term operation of platforms in space,
including long-term structural, optical and electronic
degradation of materials in the ambient near-earth
environment, survivability under and hardening against
irradiation from directed-energy weapons, vulnerability
in disturbed nuclear atmospheres, and discrimination and
sensing techniques based on characteristic radiation
(glow) signatures. Significant, and in some cases,
startling progress has been made in carrying out the
research goals of this effort. (JHD)

DESCRIPTORS: (U)   *BEAMS(RADIATION), *CHEMICAL BONDS,
*SURFACE REACTIONS, *SURFACE CHEMISTRY, DEGRADATION,

AD-A221 767

AD-A221 767

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 764   7/5   7/3   AD-A221 764   CONTINUED

WISCONSIN UNIV-MADISON DEPT OF CHEMISTRY   IDENTIFIERS: (U)   Dimethylgermylene.

(U) Photochemistry of a Matrix-Isolated Geminal Diazide.
     Dimethylgermylene.

    89   4P

PERSONAL AUTHORS: Barrau, Jacques; Bean, Dennis L.; Welsh,
Kevin M.; West, Robert; Michl, Josef

CONTRACT NO.   F49620-88-C-0010

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
    TR-90-0619

        UNCLASSIFIED REPORT

ABSTRACT: (U)   Divalent compounds of elements of group 14
have been the subject of considerable experimental and
theoretical scrutiny. Quite a few reports on the direct
observation of organosilylenes have appeared since the
initial observation of dimethylsilylene, but
spectroscopic data on simple organogermylenes remain
rather limited. A few dialkylgermylenes and
diarylgermylenes have been characterized by ultraviolet,
nuclear magnetic resonance, and extended x-ray absorption
fine structure spectroscopy but, to our knowledge, there
is no precedent for IR observation. We report herein the
IR and UV spectroscopic characterization of matrix-
isolated dimethylgermylene, Me2Ge, which has been
frequently postulated as intermediate in thermal and
photochemical processes. Keywords: Reprints,
Organometallic compounds, Carbenes, Silicon compounds,
Silylenes. (JG)

DESCRIPTORS: (U)   *PHOTOCHEMICAL REACTIONS, *MATRIX
MATERIALS, *AZIDES, CARBENES, NUCLEAR MAGNETIC RESONANCE,
OBSERVATION, ORGANOMETALLIC COMPOUNDS, REPRINTS, SILICON
COMPOUNDS, SPECTROSCOPY, THERMAL PROPERTIES, VALENCE.

AD-A221 764

AD-A221 764

AD-A221 758   12/1

AD-A221 725   9/5

NORTH CAROLINA STATE UNIV AT RALEIGH DEPT OF MATHEMATICS

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) Convergence of BDF Approximations for Nonsolvable
     Differential Algebraic Equations,

(U) Quantum Wells for Optics and Optoelectronics. 1989
     Technical Digest Series Held in Salt Lake City, Utah
     on 6-8 March 1989. Volume 10.

90   7P

PERSONAL AUTHORS: Campbell, Stephen L.; Clark, Kenneth D.

DESCRIPTIVE NOTE: Final rept. 2 Jan 89-31 Jan 90.

CONTRACT NO.   AFOSR-87-0051

JAN 90   329P

PROJECT NO.   2304

CONTRACT NO.   AFOSR-89-0268

TASK NO.   A1

PROJECT NO.   2301

MONITOR: AFOSR
            TR-90-0630

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0414

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U)   It is shown tha a BDF (Backwards
Differentiation Formulas) method applied to a
differential algebraic equation, $F(t,z,z') = 0$, can have
a unique limit as the stepsize goes to zero even if the
differential algebraic equations does not have unique
solutions. This means that convergence of numerical
methods cannot be used by practitioners to establish
uniqueness of solutions for implicit models. Reprints.
(JHD)

ABSTRACT: (U)   The Optical Society of America sponsors
topical meeting on subjects in which many rapid advances
are taking place so that contributors to the field may
interchange ideas to their mutual benefit. The Photonic
Science Topical Meeting Series included the following
subjects: a) Nonlinear guided Wave Phenomena: Physics and
Applications, b) Microphysics of Surfaces, Beams and
Adsorbates, c) Optical Computing, d) Photonic Switching,
e) Quantum Wells for Optics and Optoelectronics, f)
Picosecond Electronics and Optoelectronics, g) High
Intensity Laser Radiation on Atoms and Surface, h)
Quantum Limited Imaging and Information Processing, and i)
Signal Recovery and Synthesis. (rh)

DESCRIPTORS: (U)   *ALGEBRAIC FUNCTIONS, *DIFFERENTIAL
EQUATIONS, CONVERGENCE, NUMERICAL METHODS AND PROCEDURES,
REPRINTS.

DESCRIPTORS: (U)   *QUANTUM ELECTRONICS, ATOMS,
COMPUTATIONS, ELECTRONICS, ELECTROOPTICS, HIGH RATE,
IMAGES, INFORMATION PROCESSING, INTENSITY, LASER BEAMS,
NONLINEAR SYSTEMS, OPTICAL PROCESSING, OPTICS, PHOTONS,
PHYSICS, QUANTUM ELECTRONICS, QUANTUM THEORY, RADIATION,
RECOVERY, SIGNALS, SURFACES, SWITCHING, SYNTHESIS,
WAVEGUIDES, ATOMS, COMPUTATIONS, ELECTRONICS,
ELECTROOPTICS, HIGH RATE, IMAGES, INFORMATION PROCESSING,
INTENSITY, LASER BEAMS, NONLINEAR SYSTEMS, OPTICAL

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A1, BDF(Backwards
Differentiating Formulas), Uniqueness Theorems.

AD-A221 725

AD-A221 758

AD-A221 725   CONTINUED

PROCESSING, OPTICS, PHOTONS, PHYSICS, QUANTUM THEORY,
RADIATION, RECOVERY, SIGNALS, SURFACES, SWITCHING,
SYNTHESIS, WAVEGUIDES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2301A1.

AD-A221 705   20/5

WASHINGTON UNIV SEATTLE DEPT OF CHEMISTRY

(U) Grant 'Theoretical Studies of Time-of-Flight and Atom
     and Molecular Surface Collision'.

DESCRIPTIVE NOTE: Final rept. 1 Nov 86-31 Oct 89,

APR 90   5P

PERSONAL AUTHORS: Heller, E. J.

CONTRACT NO.   AFOSR-87-0075

PROJECT NO.   2303

TASK NO.   A3

MONITOR: AFOSR
           TR-90-0423

UNCLASSIFIED REPORT

ABSTRACT: (U)   The finished work, dealing with cross
sections for scattering from defects on surfaces, will be
a classic work, since the definition of the cross section
had not been done properly before. The second project has
to do with trapping and sticking coefficients in low and
medium energy collisions of atoms and molecules with
surfaces. The aim is to lay to rest the long standing
debate regarding the low energy asymptotic limit of
sticking coefficients: is it 0? or 1? A student was
looking at improvements to the wavepacket code for atom
surface collisions. He also had started a project
involving atom scattering with a vibrating adatom on a
surface. Another unfinished project is inspired by some
data that Tom Engel has generated on scattering of helium
from stepped surfaces. He sees, at certain angles aimed
into the steps, a scattering in non-Bragg directions,
even though there is supposedly little or not disorder.
The scattering is at half the momentum transfer of the
perfect surface and rather broad, suggesting that perhaps
steps of twice the usual length are involved. (JHD)

DESCRIPTORS: (U)   *ATOMIC BEAMS, *SCATTERING CROSS
SECTIONS, *MOLECULAR BEAMS, ADATOMS, COEFFICIENTS,
COLLISIONS, DEFECTS(MATERIALS), ENERGY, HELIUM, LOW
ENERGY, MOLECULAR PROPERTIES, MOMENTUM TRANSFER,
SCATTERING, SURFACES, VIBRATION.

AD-A221 705

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 705   CONTINUED

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, *Atomic
Scattering, *Molecular Scattering.

AD-A221 702:   5/8   5/9

BOSTON UNIV MA CENTER FOR ADAPTIVE SYSTEMS

(U) The Cognitive, Perceptual, and Neural Bases of Skilled
Performance.

DESCRIPTIVE NOTE: Final scientific rept. 1 Oct 87-31 Dec
89,

APR 90   42P

PERSONAL AUTHORS: Grossberg, Stephen

CONTRACT NO.   F49820-87-C-0018

PROJECT NO.   3484

TASK NO.   A4

MONITOR: AFOSR
            TR-90-0631

UNCLASSIFIED REPORT

ABSTRACT: (U)   This project carried out an
interdisciplinary research program among scientists and
students of the Boston Consortium for Behavioral and
Neural Studies, which includes investigators from seven
Boston-area institutions. Projects concerning the
cognitive, perceptual, and neural bases of skilled
performance included both experimental and theoretical
studies of vision, speech, adaptive pattern recognition,
attentive cognitive information processing, reinforcement
learning and prediction, and adaptive sensory-motor
control and planning. These studies paid particular
attention to those properties of biological intelligence
that can autonomously adapt in real-time to unexpected
events. Major progress was made towards discovering and
characterizing neural network architectures in all of the
project areas. (KR)

DESCRIPTORS: (U)   *PERFORMANCE(HUMAN), *PERCEPTION,
*COGNITION, *NEURAL NETS, ADAPTIVE SYSTEMS, ARCHITECTURE,
BEHAVIORAL SCIENCES, BIOLOGY, EXPERIMENTAL DATA,
INTELLIGENCE, LEARNING, NERVOUS SYSTEM, PATTERN
RECOGNITION, SPEECH, STUDENTS, THEORY, VISION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR3484A4.

AD-A221 702

PAGE   20   EVK11C

AD-A221 684   12/3   AD-A221 682   21/3   20/9

ILLINOIS UNIV AT CHICAGO CIRCLE DEPT OF MATHEMATICS   OHIO STATE UNIV COLUMBUS DEPT OF AERONAUTICAL AND
STATISTICS AND COMPUTER SC IENCE   ASTRONAUTICAL ENGINEERING

(U) Optimal Block Designs for Comparing Test Treatments   (U) Laser Diagnostics of Plasma Thrusters.
    with a Control when K is Greater than V,
                                                            DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,
      89   16P
                                                              APR 90   16P
PERSONAL AUTHORS: Jacroux, Mike; Majumdar, Dibyen
                                                            PERSONAL AUTHORS: York, Thomas M.
CONTRACT NO.   AFOSR-85-0320
                                                            CONTRACT NO.   AFOSR-89-0120
PROJECT NO.   2304
                                                            PROJECT NO.   2308
TASK NO.   A5
                                                            TASK NO.   A1
MONITOR: AFOSR
           TR-90-0397   MONITOR: AFOSR
                                                                       TR-90-0636
          UNCLASSIFIED REPORT
                                                                      UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Statistical Planning
and Inference, v23 p381-396 1989.

ABSTRACT: (U)   The problem of comparing v test treatments
with a control in b blocks of size k each is considered
for the case k>v. Some sufficient conditions for designs
to be A and MV-optima. in these experimental situations
are derived and examples are given to demonstrate how the
sufficient conditions obtained can be applied. Some
infinite families of optimal designs that satisfy the
sufficient conditions obtained are also given. For cases
where the derived sufficient conditions are not
applicable some 'approximately' optimal designs are
suggested for usage. Keywords: A-optimality; MV-
optimality; BTIB design; BIB design; BIB design; Balanced
block design; 2-way elimination of heterogeneity;
Reprints. (kr)

ABSTRACT: (U)   The research involves diagnostics studies
of plasma thrusters. These devices generate ionized gases
which are accelerated at thermal and electromagnetic
modes. The research effort uses the new, high resolution
diagnostic techniques that will determine electron
densities, local magnetic fields and density fluctuations
indicating anomalous transport. A long wavelength carbon
dioxide laser which allows more sensitive measurements,
with its long wavelength, is used. The laser will be
coupled with a Far Infrared Laser System capable of
generating beams around ten milliwatt levels, and provide
a diagnostic study that has not yet been used in thruster
plasma diagnosis. Keywords: Laser diagnostics; Multi-beam
interferometry; Fluctuation. (JHD)

DESCRIPTORS: (U) *STATISTICAL TESTS, *EXPERIMENTAL
DESIGN, *OPTIMIZATION, COMPARISON, REPRINTS, TEST AND
EVALUATION

DESCRIPTORS: (U)   *PLASMA DIAGNOSTICS, *PLASMA ENGINES,
ELECTROMAGNETIC RADIATION, ELECTRON DENSITY, FAR INFRARED
RADIATION, INFRARED LASERS, INTERFEROMETRY, IONIZED GASES,
LASER APPLICATIONS, LASERS, LONG WAVELENGTHS, MAGNETIC
FIELDS, MEASUREMENT, MULTIPLE BEAMS(RADIATION),
PLASMAS(PHYSICS), SENSITIVITY, THRUSTERS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A5, *Block designs.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A1.

AD-A221 684

AD-A221 682

DTIC REPORT BIBLIOGRAPHY · SEARCH CONTROL NO. EVK11C

AD-A221 672   20/4

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Modeling of Free Viscoelastic Jets and Instability Mechanisms.

DESCRIPTIVE NOTE: Final rept. 1 Apr 88-31 Mar 90,

MAR 90   7P

PERSONAL AUTHORS: Forest, Greg; Bechtel, Stephen

CONTRACT NO.   AFOSR-88-0184

PROJECT NO.   2304

TASK NO.   A4

MONITOR: AFOSR
           TR-90-0448

UNCLASSIFIED REPORT

ABSTRACT: (U)   The principal investigators, have made progress on analytical, numerical, and experimental fronts in our studies of non-Newtonian fluids. We summarize the main results which have been attained during this granting period and the publications which have resulted that acknowledge this AFOSR grant. Jet flow; Slender free surface non-Newtonian jets.

DESCRIPTORS: (U)   *JET FLOW, NONNEWTONIAN FLUIDS, STABILITY, VISCOELASTICITY.

IDENTIFIERS: (U)   Free jets.

AD-A221 672

AD-A221 671   20/4

CALIFORNIA UNIV LOS ANGELES DEPT OF MECHANICAL AEROSPACE AND NUCLEAR ENGINEERING

(U) Local and Global Resonances in Heated 2-D Jets.

DESCRIPTIVE NOTE: Final rept. 1 Sep 87-31 Jul 89.

NOV 89   77P

PERSONAL AUTHORS: Yu, Ming H.; Monkewitz, Peter A.

CONTRACT NO.   AFOSR-87-0329

PROJECT NO.   2307

TASK NO.   A2

MONITOR: AFOSR
           TR-90-0455

UNCLASSIFIED REPORT

ABSTRACT: (U)   The connection between local and global stability properties of free shear flows was investigated. For 2-D inviscid jets, absolute instability was found for ratios of jet to ambient density below 0.9. Low wake heating (density) eliminates all local absolute instability. In 2-D heated jets, experiments showed that local absolute instability does lead to global instability and self-excitation at a density ratio of 0.9. The flow was documented with Schlieren and mean velocity and temperature measurements. The global linear stability of a slowly diverging inviscid shear flow has been theoretically analyzed by WKB methods. Global characteristics are found, under certain assumptions, to be determined by a region where the absolute frequency of the mode with zero group velocity has a saddle. Keywords: Jet flow; Two dimensional flow; Turbulence; Heated jets. (edc)

DESCRIPTORS: (U)   *JET FLOW, EXCITATION, FREQUENCY, GLOBAL, HEATING, INVISCID FLOW, LINEARITY, MEAN, MEASUREMENT, RATIOS, RESONANCE, SCHLIEREN PHOTOGRAPHY, SHEAR PROPERTIES, STABILITY, TEMPERATURE, TURBULENCE, TWO DIMENSIONAL FLOW, VELOCITY, WAKE.

IDENTIFIERS: (U)   Wake heating, Heated jets, Group velocity, Instability, WUAFOSR2307A2, PE61102F.

AD-A221 671

AD-A221 668   8/4   5/8

CENTRAL INST FOR THE DEAF   ST LOUIS MO

(U) Binaural Masking: An Analysis of Models.

DESCRIPTIVE NOTE: Annual technical rept. 1 Apr 89-31 Mar 90,

APR 90   12P

PERSONAL AUTHORS: Gilkey, Robert H.

CONTRACT NO.   AFOSR-89-0302

PROJECT NO.   2313

TASK NO.   A6

MONITOR: AFOSR
TR-90-0632

UNCLASSIFIED REPORT

ABSTRACT: (U)   The ultimate goal of the project is to specify the transformations of the auditory stimulus used by the subject to determine the presence or absence of a signal when masked by an interfering sound, with particular emphasis on the role of processes that compare information in the frequency domain and in the time domain, and on the relation between monaural and binaural processing. Traditional psychophysical procedures are combined with new techniques (molecular psychophysics), which allow the data to be examined in considerably, greater detail. With these techniques, conclusions and theories based on more general analyses are often shown to be inadequate. A number of experiments were conducted to evaluate models of monaural and binaural masking. The responses of subjects to individual noise-alone and signal-plus-noise waveforms could not be predicted based on the energy in a single auditory filter or a linear combination of several auditory filters. Keywords: Auditory activity, Hearing, Thresholds (Psychology), Noise reduction, Psychophysics, Detection. (jg)

DESCRIPTORS: (U)   *HEARING, *MASKING, DETECTION, FILTERS, FREQUENCY, MOLECULES, NOISE REDUCTION, PSYCHOLOGY, PSYCHOPHYSICS, STIMULI.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2313A6.

AD-A221 668

AD-A221 665   12/5   5/6

ILLINOIS UNIV AT URBANA AVIATION RESEARCH LAB

(U) Durip-Visual Simulation Laboratory.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,

APR 90   4P

PERSONAL AUTHORS: Anderson, George; Lintern, Gavan

CONTRACT NO.   AFOSR-89-0161

PROJECT NO.   3842

TASK NO.   A4

MONITOR: AFOSR
TR-90-0421

UNCLASSIFIED REPORT

ABSTRACT: (U)   Funds in the amount of $124,000 were awarded for the purchase of visual simulation equipment. The items purchased with this grant are being integrated with a Frasca simulator cockpit which has flight dynamics resident in a DEC personal computer. Two Evans and Sutherland SPX image generators are to be integrated with this system and the Electro Holme projectors will be used to project the visual images they generate. The IRIS 4D and the IMI 600SN will serve as alternate workstations that will be driven by the flight simulator. This configuration of equipment will allow the exploration of a wide range of behavioral issues that are relevant to flight simulation.

DESCRIPTORS: (U)   *FLIGHT SIMULATION, *VISION, *COMPUTERIZED SIMULATION, COCKPITS, CONFIGURATIONS, DYNAMICS, FLIGHT SIMULATORS, GENERATORS, IMAGES, RANGE(EXTREMES), SIMULATORS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR3842A4.

AD-A221 665

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 663   6/5

AD-A221 663   CONTINUED

PATTERNS, PHENOLS, TOLUENES, WATER.

IOWA UNIV IOWA CITY DEPT OF MICROBIOLOGY

(U) Monohydroxylation of Phenol and 2,5-Dichlorophenol by
Toluene Dioxygenase in Pseudomonas putida F1.

OCT 89   8P

PERSONAL AUTHORS: Spain, J. C.; Zylstra, G. J.; Blake, C.
K.; Gibson, D. T.

CONTRACT NO.   AFOSR-88-0225

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0443

UNCLASSIFIED REPORT

ABSTRACT: (U)   Pseudomonas putida F1 contains a
multicomponent enzyme system, toluene dioxygenase, that
converts toluene and a variety of substituted benzenes to
cis-dihydrodiols by the addition of one molecule of
molecular oxygen. Toluene-grown cells of P. putida F1
also catalyze the monohydroxylation of phenols to the
corresponding catechols by an unknown mechanism.
Respirometric studies with washed cells revealed similar
enzyme induction patterns in cells grown on toluene or
phenol. Induction of toluene dioxygenase and subsequent
enzymes for catechol oxidation allowed growth on phenol.
Tests with specific mutants of P. putida F1 indicated
that the ability to hydroxylate phenols was only
expressed in cells that contained an active toluene
dioxygenase enzyme system. 18O2 experiments indicated
that the overall reaction involved the incorporation of
only one atom of oxygen in the catechol, which suggests
either a monooxygenase mechanism or a dioxygenase
reaction with subsequent specific elimination of water.
(JES)

DESCRIPTORS: (U)   *MEDICINE, ATOMS, BENZENE, CELLS,
ELIMINATION, ENZYMES, GROWTH(GENERAL), INDUCTION SYSTEMS,
MOLECULAR PROPERTIES, MOLECULES, OXIDATION, OXYGEN,

AD-A221 663

AD-A221 661   13/13

AD-A221 661   CONTINUED

GEORGE WASHINGTON UNIV HAMPTON VA JOINT INST FOR
ADVANCEMENT OF FLIGHT SCIENC ES

(U) Improved Computational Strategy for Predicting the
Response of Complex Systems.

DESCRIPTIVE NOTE: Final rept. 1 Jan 87-31 Dec 89,

MAR 90   32P

PERSONAL AUTHORS: Noor, Ahmed K.

CONTRACT NO. AFOSR-87-0115

PROJECT NO. 2302

TASK NO. B1

MONITOR: AFOSR
TR-90-0452

UNCLASSIFIED REPORT

RESPONSE, *PREDICTIONS, ACCURACY, COMPOSITE STRUCTURES,
COMPUTATIONS, DEGREES OF FREEDOM, DISPLACEMENT, DYNAMICS,
EFFICIENCY, ITERATIONS, LAMINATES, MATHEMATICAL MODELS,
NONLINEAR ANALYSIS, NONLINEAR SYSTEMS,
OPERATORS(PERSONNEL), PARAMETERS, PERTURBATIONS, PLATES,
REDUCTION, RESPONSE, SHELLS(STRUCTURAL FORMS), SPLITTING,
STARTING, STRATEGY, STRESS ANALYSIS, STRESSES, STRUCTURAL
PROPERTIES, STRUCTURES, TRANSVERSE, TWO DIMENSIONAL,
VIBRATION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2302B1.

ABSTRACT: (U)   An effective computational strategy has
been developed for the analysis of large and complex
structures. The strategy is based on generating the
response of the complex structures using large
perturbations from that of a lower-order (simpler) model
associated with a simpler structure (or a simpler
mathematical/discrete model of the original structure).
The three key elements of the strategy are: a) mixed (or
primitive variable) formulation with the fundamental
unknowns consisting of generalized displacements and
stress parameters; b) operator splitting, or a reduction
method to relate the arrays and degrees of freedom of the
original complex structure to those of the simpler system;
and c) efficient iterative process for the generation of
the response of the complex structure starting from that
of the simpler system. The strategy has been successfully
applied to a number of linear and nonlinear stress
analysis problems, free vibration and nonlinear
structural dynamics problems. The strategy was also used
to obtain accurate transverse stresses in laminated
composite plates and shells, using the two-dimensional
first-order shell (plate) theory as the simpler model.
Keywords: Abstracts. (kr)

DESCRIPTORS: (U) *STRUCTURAL ANALYSIS, *STRUCTURAL

AD-A221 661

AD-A221 661

DTIC REPORT BIBLIOGRAPHY

AD-A221 821   12/1

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF ELECTRICAL
ENGINEERING AND COMPUTER S CIENCE

(U) Analysis and Design Methods for Nonlinear Control
    Systems.

DESCRIPTIVE NOTE: Final rept. 1 Mar 87-28 Feb 90,

MAR 90   7P

PERSONAL AUTHORS: Rugh, Wilson J.

CONTRACT NO.   AFOSR-87-0101

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0447

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report briefly describes research
results on the analysis and design of nonlinear control
systems obtained by the author and his students over the
three-year period of support. The main focus of the
research has been on a new approach for designing
nonlinear control laws that is called design by extended
linearization. Results reported include a method for
designing nonlinear controllers of proportional-integral-
derivative type, a method for designing nonlinear control
laws that achieve asymptotic tracking of reference
signals and rejection of disturbance signals for
nonlinear plants, and a method for achieving approximate
noninteraction with stability in cases where exact
noninteraction with stability cannot be achieved.
Technical publications describing these and other results
are listed. Keywords: Control theory. (KR)

DESCRIPTORS: (U)   *CONTROL SYSTEMS, *NONLINEAR SYSTEMS,
CONTROL THEORY, LINEARITY, REJECTION, SIGNALS, STUDENTS.

IDENTIFIERS: (U)   WUAFOSR2304A1, PE61102F.

AD-A221 821

AD-A221 619   12/3

WISCONSIN UNIV-MADISON DEPT OF STATISTICS

(U) Multivariate Model Building and Model Identification.

DESCRIPTIVE NOTE: Final rept. 1 Apr 87-31 Dec 89,

APR 90   4P

PERSONAL AUTHORS: Wahba, Grace

CONTRACT NO.   AFOSR-87-0171

PROJECT NO.   2304

TASK NO.   A5

MONITOR: AFOSR
           TR-90-0427

UNCLASSIFIED REPORT

ABSTRACT: (U)   A very substantial number of results were
obtained during this contract in the area of multivariate
model building and model identification. A list of
publications in which the Air Force Contract is mentioned
appears below. We are continuing this work in the follow
on contract, AFOSR 90-0103. The research monograph Spline
Models for Observational Data by the PI was published by
The Society for Industrial and Applied Mathematics in
March 1990 as volume 59 in the prestigious CBMS-NSF
Regional Conference Series in Applied Mathematics.
Although the actual writing of this monograph was not
supported by the AFOSR, a number of research results
obtained under AFOSR sponsorship are discussed in it. We
have acknowledged in the Foreword the research support of
the AFOSR. (KR)

DESCRIPTORS: (U)   *MATHEMATICAL MODELS, *MULTIVARIATE
ANALYSIS, AIR FORCE PROCUREMENT, APPLIED MATHEMATICS,
DOCUMENTS, IDENTIFICATION, INDUSTRIES, MODELS, RESEARCH
MANAGEMENT, SPLINES.

IDENTIFIERS: (U)   WUAFOSR2304A5, PE61102F.

AD-A221 619

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 611   6/7   6/1

AD-A221 610   6/1

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

EAST CAROLINA UNIV SCHOOL OF MEDICINE GREENVILLE NC

(U) A Fine Tuning of Photoreactivity of Large Ring 2-Phenylcycloalkanones Adsorbed in Cyclodextrins,

(U) BOAA Selectively Enhances L-Glutamate Release from Guinea Pig Hippocampal Mossy Fiber Synaptosomes,

90   5P

89   7P

PERSONAL AUTHORS: Rao, V. P.; Han, N.; Turro, N. J.

PERSONAL AUTHORS: Terrian, David M.; Gannon, Robert L.

CONTRACT NO.   AFOSR-90-0049

CONTRACT NO.   AFOSR-89-0531

PROJECT NO.   2303

PROJECT NO.   2312

TASK NO.   B2

TASK NO.   A2

MONITOR: AFOSR
           TR-90-0454

MONITOR: AFOSR
           TR-90-0430

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U)   The photochemistry of solid complexes of large ring 2-phenylcycloalkanones adsorbed in cyclodextrin cavities results in significant yields of enals as disproportionation products at the expense of the para-rearrangement, depending on both the ring size of the cycloanone and the cavity size of the cyclodextrin. This behavior contrasts with its photoreaction in homogeneous solutions which yields predominantly paracyclophanes. Keywords: Cyclodextrins; Paracyclophanes; Host guest molecules; Photochemistry; Reprints. (JHD)

ABSTRACT: (U)   The neurotoxic amino acids Beta-N-oxalylamino-L-alanine (BOAA) and Beta-N-methylamino-L-alanine (BMAA) were evaluated for possible effects on spontaneous and stimulus-evoked release of L-glutamate (L-Glu) and dynorphin A(1-8)-like immunoreactivity (LI) from guinea pig hippocampal mossy fiber synaptosomes. BOAA (200 microns), but not BMAA (1 mM), was found to significantly increase both basal cytosolic and KC1-stimulated vesicular release of L-Glu. Neither BOAA nor BMAA had any effect on dynorphin A(1--8)-LI release from these synaptosomes. This is the first report describing a presynaptic facilitatory action of BOAA upon L-Glu release; an effect which may contribute to the neurotoxic properties of this proposed environmental toxin. Reprints. (JES)

DESCRIPTORS: (U)   *DEXTRINS, *CYCLOALKANES, *PHOTOCHEMICAL REACTIONS, CAVITIES, COSTS, DISPROPORTIONATION, HOMOGENEITY, MOLECULAR COMPLEXES, REPRINTS, RINGS, SIZES(DIMENSIONS), SOLIDS, SOLUTIONS(GENERAL), TUNING, AROMATIC COMPOUNDS.

DESCRIPTORS: (U)   , ENVIRONMENTS, REPRINTS, TOXINS AND ANTITOXINS.

IDENTIFIERS: (U)   WUAFOSR2303B2, PE61102F, Alkanone/2-Phenylcyclo, Dextrin/Cyclo.

IDENTIFIERS: (U)   WUAFOSR2312A2, PE61102F.

AD-A221 611

AD-A221 610

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 609   8/1

AD-A221 609   CONTINUED

EAST CAROLINA UNIV SCHOOL OF MEDICINE GREENVILLE NC

ACID, HIGH RATE, HIPPOCAMPUS, NERVE CELLS, PEPTIDES,
PYRAMIDS(GEOMETRY), SALTS, SPINAL COLUMN,
STIMULATION(GENERAL), ZINC.

(U) Glutamate is the Endogenous Amino Acid Selectively
Released by Rat Hippocampal Mossy Fiber Synaptosomes
Concomitantly with Prodynorphin-Derived Peptides,

IDENTIFIERS: (U)   WUAFOSR2312A2, PE61102F.

90   6P

PERSONAL AUTHORS: Terrian, David M.; Gannon, Robert L.;
Rea, Michael A.

CONTRACT NO.   AFOSR-89-0531

PROJECT NO.   2312

TASK NO.   A2

MONITOR: AFOSR
TR-90-0432

UNCLASSIFIED REPORT

ABSTRACT: (U)   The hippocampal mossy fiber (MF) pathway
interconnects the granule cells of area dentata with
regio inferior of Ammon's horn where the MFs expand and
terminate primarily in the CA3 subfield on apical
dendrites proximal to the somata of pyramidal neurons (1,
2). Within the hippocampus, these MF-CA3 synapses present
several distinctive features. Mature MF terminals are
large, morphologically complex, structures that
invaginate numerous dendritic spines (1) and contain
unusually high concentrations of zinc (3) and
prodynorphinderived peptides (4,5). Like other excitatory
monosynaptic hippocampal pathways (6), long-term synaptic
potentiation (LTP) can be elicited by repetitive
stimulation of the MFs (7-9). However, unlike these other
hippocampal circuits, the induction of LTP at MF-CA3
synapses is mediated by non-N-methyl-D-aspartate (NMDA)
receptors (8) that are apparently coupled to pertussis
toxin sensitive G-proteins (9). These results suggest
that at least two different mechanisms for the induction
of LTP may be employed in the hippocampus. (jes)

DESCRIPTORS: (U)   *GLUTAMIC ACID, SALTS, CIRCUITS,
CONCENTRATION(COMPOSITION), DENDRITIC STRUCTURE, GLUTAMIC

AD-A221 609

AD-A221 609

AD-A221 608   7/6   7/4   7/3   AD-A221 607   20/5

COLUMBIA UNIV NEW YORK   CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Ru99 NMR Spectroscopy of Ruthenium(II) Polypyridyl   (U) Structure, Reactivity, and Energetics of Covalently
    Complexes,   Bound Carbon Cluster Ions, C5(+) to C11(+): Experiment
                                                              and Theory,

    90   4P   89   12P

PERSONAL AUTHORS: Orellana, Guillermo; Kirsch-De
Mesmaeker, Andree; Turro, Nicholas J.   PERSONAL AUTHORS: Radi, P. P.; Rincon, M. E.; Hsu, M. T.;
Brodbelt-Lastig, J.; Kemper, P.

CONTRACT NO. AFOSR-90-0049   CONTRACT NO. AFOSR-89-0102

PROJECT NO. 2303   PROJECT NO. 2303

TASK NO. B2   TASK NO. B1

MONITOR: AFOSR   MONITOR: AFOSR
          TR-90-0451   TR-90-0461

UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

ABSTRACT: (U)   Ruthenium 99 nuclear magnetic resonance
spectroscopy is a powerful technique for the study of
small variations around the metal core and geometrical
isomerism in mono- and polynuclear ruthenium (II)
polypyridyl complexes. There is enormous potential of
this technique to sort out geometrical features of this
class of compounds. Different types of chelating ligands
have been selected for systematically studying
monometallic as well as polymetallic complexes. Keywords:
Metal complexes; Ruthenium isotopes; Reprints. (jhd)   ABSTRACT: (U)   Laser ablation from a rotating,
translating graphite rod is used to create a broad
distribution of internally energized carbon cluster ions
C (+)sub n. These energized clusters are accelerated,
size selected by a magnet, and allowed to undergo
unimolecular decay in a field-free region. The decay
products are mass and energy analyzed by a high-
resolution electrostatic analyzer. In this work we are
interested in clusters in the range 5 < or = 11. The
shapes of the kinetic energy distributions strongly
suggest there are no energy barriers along the reaction
coordinates. A detailed analysis of the kinetic energy
distributions and metastable branching ratios was
accomplished using the transition-state switching form of
statistical phase space theory. The analysis yielded
binding energies for each of the fragmentations observed.
In general these are in excellent agreement with the ab
initio calculations of Raghavachari and Binkley. It is
also unambiguously shown for parent cluster ions with 5 <
or = 10 that the observed fragmentations are due to
linear clusters decaying to linear products. A cyclic
parent ion structure for C(+) sub 11 could not be ruled
out. Excellent agreement between experiment and theory is

DESCRIPTORS: (U)   *CHELATING AGENTS, *ISOTOPE_EFFECTS,
*METAL COMPLEXES, *NUCLEAR MAGNETIC RESONANCE, CORES,
LIGANDS, METALS, REPRINTS, RUTHENIUM, VARIATIONS.

IDENTIFIERS: (U)   WUAFOSR2303B2, PE61102F, Pyridyl/
Ruthenium Poly.

AD-A221 608   AD-A221 607

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 807   CONTINUED

AD-A221 589   20/5   7/4

,STANFORD UNIV CA

(U) State-to-State Ion-Molecule Reaction Dynamics at
     Thermal Energies.

obtained in those cases where more than one product
channel is observed. Reprints. (jhd)

DESCRIPTIVE NOTE: Final technical rept. 1 Nov 88-31 Oct
89,

DESCRIPTORS: (U)   *CLUSTERING, *CATIONS, *LASER PUMPING,
ABLATION, BARRIERS, CARBON, CHANNELS, DECAY,
ELECTROSTATIC ANALYZERS, ENERGETIC PROPERTIES, GRAPHITE,
HIGH RESOLUTION, KINETIC ENERGY, NUCLEAR BINDING ENERGY,
REACTIVITIES, REPRINTS, RODS.

MAR 90   4P

PERSONAL AUTHORS: Zare, Richard N.

CONTRACT NO.   AFOSR-89-0128

IDENTIFIERS: (U)   WUAFOSR2303B1, PE61102F.

PROJECT NO.   3842

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0456

UNCLASSIFIED REPORT

ABSTRACT: (U)   Our application for the DURIP grant was
motivated by our need for an intense, narrow band-width
tunable ultraviolet pulsed laser source to conduct
experiments under our current research grant (AFOSR-89-
0264). The laser system we purchased from Spectra-Physics,
using the DURIP grant, delivers over 30 milliJoules per
pulse of tunable light at 280 nanometer with a bandwidth
as small as .08 wave numbers. We have employed this new
laser system to measure ion state distributions using
high resolution photoelectron kinetic energy spectroscopy.
This laser system is also being used to conduct two color
ionize/probe experiments, which permit the study of
collisional relaxation and charge transfer. Using the
DURIP grant we also plan to upgrade our WEX-1 wavelength
extension unit to accommodate a (2,5-dibiphenylyloxazole)
crystal. This upgrade will extend the wavelength range
over which we can generate greater than 3 milliJoules per
pulse to wavelengths as short as 200 nanometers. C27H21NO,
Ionization counters, Nuclear instrumentation, Molecular
ions, Thermal properties, Reaction kinetics, Resonance
Enhanced MultiPhoton Ionization (REMPI). (Jg)

DESCRIPTORS: (U)   *DYNAMICS, *MOLECULAR IONS, *THERMAL
PROPERTIES, CHARGE TRANSFER, COLLISIONS, DISTRIBUTION,
ENERGY, FREQUENCY, IONIZATION GAGES, IONS, LASERS, LIGHT,

AD-A221 589

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 589   CONTINUED

MOLECULES, NUCLEAR INSTRUMENTATION, PHOTOIONIZATION,
PROBES, PULSES, REACTION KINETICS, RELAXATION, TUNING.

IDENTIFIERS: (U) PE61104D, WUAFOSR3842A2.

AD-A221 567   20/5

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Photodissociation Dynamics of Ar3(+).

JUN 89   8P

PERSONAL AUTHORS: Snodgrass, Joseph T.; Roehl, Coleen M.;
Bowers, Michael T.

CONTRACT NO.   AFOSR-89-0102

PROJECT NO.   2303

TASK NO.   B1

MONITOR: AFOSR
TR-90-0460

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,
v159 n1 p10-16, 30 Jun 89.

ABSTRACT: (U)   Mass selected Ar 3(+) clusters are
photodissociated by a polarized argon-ion laser beam at
514, 488 and 458 nm. Only Ar+/2Ar products are observed.
Laser polarization dependence of the product laboratory
kinetic energy peak shapes indicates that a pure parallel
transition is responsible for the photodissociation.
Analysis indicates it is almost certainly a 2 Sigma (+)
sub u to 2 Sigma (+) sub g transition resulting in
Ar+(2P1/2). The product kinetic energy distribution is
strongly bimodal with approximately 75% of the products
at high kinetic energy (near the energy conservation
limit) and 25% with near zero kinetic energy. A model is
developed that explains this unexpected (and dynamically
informative) result. Reprints. (JHD)

DESCRIPTORS: (U) *ARGON LASERS, *PHOTODISSOCIATION,
ARGON, ENERGY, ENERGY CONSERVATION, HIGH ENERGY, IONS,
KINETIC ENERGY, LASER BEAMS, CLUSTERING, LIMITATIONS,
PARALLEL ORIENTATION, POLARIZATION, PURITY, REPRINTS,
TRANSITIONS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B1.

AD-A221 567

AD-A221 589

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 564   20/4

AD-A221 564   CONTINUED

LEHIGH UNIV BETHLEHEM PA DEPT OF MECHANICAL ENGINEERING
AND MECHANICS

apparently it is necessary to account for the effect of
normal pressure variations to continue the interaction.
Keywords: Vortices; Turbulent boundary layer; Turbulent
bursts; Boundary-layer eruptions; Unsteady interactions;
Boundary layer flow separation. (edc)

(U) Vortex-Induced Boundary Layer Separation.

DESCRIPTIVE NOTE: Interim rept. Nov 88-Oct 89.

OCT 89   337P

PERSONAL AUTHORS: Peridier, Vallorie J.; Walker, James D.

REPORT NO.   FM-13

CONTRACT NO.   AFOSR-89-0065

PROJECT NO.   2307

TASK NO.   A2

MONITOR: AFOSR
TR-90-0458

UNCLASSIFIED REPORT

DESCRIPTORS: (U)   *BOUNDARY LAYER FLOW, *FLOW SEPARATION,
*TURBULENT BOUNDARY LAYER, *VORTICES, ADVERSE CONDITIONS,
ALGORITHMS, BOUNDARY LAYER, DYNAMICS, EDDIES(FLUID
MECHANICS), EJECTION, EXTERNAL, FLOW, FLUIDS, HIGH RATE,
INTERACTIONS, INVISCID FLOW, LAGRANGIAN FUNCTIONS, LAYERS,
LIMITATIONS, PARTICLES, PRESSURE, PRESSURE GRADIENTS,
RECIRCULATION, REYNOLDS NUMBER, SOLUTIONS(GENERAL),
THINNESS, TRAJECTORIES, TWO DIMENSIONAL, UNSTEADY FLOW,
VARIABLE PRESSURE, VISCOSITY, WALLS.

IDENTIFIERS: (U)   Viscous inviscid interactions,
Turbulent bursts, Boundary later eruptions, Unsteady
interactions, PE61102F, WUAFOSR2307A2.

ABSTRACT: (U)   Unsteady boundary-layer separation at high
Reynolds numbers, Re, is considered on a theoretical and
computational basis. Whenever an external inviscid flow
induces a region of adverse pressure gradient near a wall,
the development of recirculating eddies in the boundary
layer is common. An unsteady viscous-inviscid interaction
often follows in the form of a local boundary-layer
eruption and abrupt ejection of near-wall vorticity into
the external flow. The dynamics of this process, as it
develops in an initially thin boundary layer, is
considered. As interaction ensues, the flow focuses into
a band which progressively narrows in the streamwise
direction. The complex flow development is extremely
difficult to resolve using conventional Eulerian methods;
here the boundary-layer solutions are obtained using
Lagrangian methods, wherein trajectories of a large
number of fluid particles are computed. The algorithms
developed are general but are applied here to the problem
of the boundary-layer induced by a two-dimensional vortex
above an infinite plane wall. Solutions are obtained for
the limit problem Re approaches limit of infinity, and
for Re large but finite using an interacting boundary-
layer approach. The present results describe the initial
stages of a strong unsteady viscous-inviscid interaction;

AD-A221 564

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AD-A221 547   12/7   12/4

GEORGIA INST OF TECH ATLANTA SCHOOL OF INFORMATION AND COMPUTER SCIENCE

(U) Queing Networks with Finite Capacities.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-31 Oct 89,

OCT 89   7P

PERSONAL AUTHORS: Akyildiz, Ian F.

CONTRACT NO.   AFOSR-88-0028

PROJECT NO.   2304

TASK NO.   A2

MONITOR: AFOSR
           TR-90-0464

UNCLASSIFIED REPORT

ABSTRACT: (U)   Performance has been a major issue in the design and implementation of systems such as: computer systems, production systems, communication networks and flexible manufacturing systems. The success of failure of such systems is judged by the degree to which performance objectives are met. Thus, tools and techniques for predicting performance measures are of great interest. In the last two decades it has been demonstrated several times that performance can be evaluated and/or predicted well by queuing models which can be solved either by simulation or analytical methods. Simulation is the most general and powerful technique for studying and predicting system performance. However, the high cost of running the simulation programs and uncertain statistical accuracy, makes simulation less attractive. Compared to simulation, analytical methods are more restrictive but have the advantage that it is less costly to compute numerical results. Moreover, they can be implemented very quickly, thus it is very easy to give interpretations to the relationships between model parameters and performance measures. Analytical methods have proved invaluable in modeling a variety of computer systems, computer networks, flexible manufacturing systems, etc. (kr)

DESCRIPTORS: (U)   *COMMUNICATIONS NETWORKS, *QUEUEING

AD-A221 547

AD-A221 560   9/1

BRIMROSE CORP OF AMERICA BALTIMORE MD

(U) Fabrication of Microwave Guides Using High TC Superconductors.

DESCRIPTIVE NOTE: Final rept. 15 Jul 89-14 Jan 90,

JAN 90   37P

PERSONAL AUTHORS: Trivedi, Sudhir B.

CONTRACT NO.   F49620-89-C-0111

PROJECT NO.   D822

TASK NO.   F1

MONITOR: AFOSR
           TR-90-0510

UNCLASSIFIED REPORT

ABSTRACT: (U)   The objective of this study was to produce bulk high Tc superconductor $YBa_2Cu_3O_7-x$ with microwave conductivity at least as good or better than that of copper. The subsequent aim was to fabricate cylindrical wave guide using this material. The ultimate goal of this study is to produce $YBa_2Cu_3O_7-x$ with microwave conductivity exceedingly higher (at least two orders of magnitude better) than that of copper. In principle, this is possible if the microstructure of the superconductor material is carefully controlled. The above-stated goal could be easily achieved if the large single crystals of $YBa_2Cu_3O_7-x$ are available or if the inside surface of a suitable substrate material in the form of hollow cylinder, could be coated with the superconductor material of high quality. The former approach, currently, seems to be far from practical realization. (jes)

DESCRIPTORS: (U)   *CONDUCTIVITY, COPPER, CYLINDRICAL BODIES, MATERIALS, MICROSTRUCTURE, MICROWAVES, SINGLE CRYSTALS, SUBSTRATES, SUPERCONDUCTORS, WAVEGUIDES.

IDENTIFIERS: (U)   PE63221C.

AD-A221 560

AD-A221 547   CONTINUED

THEORY, ACCURACY, COMPUTER NETWORKS, COMPUTERS, HIGH
COSTS, MANUFACTURING, MODELS, NETWORKS, NUMERICAL
ANALYSIS, PARAMETERS, PRODUCTION, SIMULATION, STATISTICAL
ANALYSIS.

IDENTIFIERS: (U)   WUAFOSR2304A2, PE61102F.

AD-A221 546   7/4

,GORDON RESEARCH CONFERENCES INC KINGSTON RI

(U)   Gordon Research Conference on the Chemistry of
Energetic Materials Held in New Hampton, New Hampshire
on 27 June-1 July 1988.

DESCRIPTIVE NOTE: Final rept.,

JUL 88   15P

PERSONAL AUTHORS: Storm, C. B.; Brill, T. B.

CONTRACT NO.   AFOSR-89-0193

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0478

UNCLASSIFIED REPORT

ABSTRACT: (U)   A Gordon Research Conference on the
Chemistry of Energetic Materials was held at the New
Hampton School 27 June - 1 July 1988. There were 110
attendees. A broad range of topics were covered:
reactions in energetic materials, modeling in reactive
systems, equation of state, structural chemistry, thermal
decomposition, new materials, spectroscopy in fast
reactions, and chemistry at high pressure. There were 28
speakers who were recognized leaders in their technology
areas. There were 40 poster papers on diverse topics.
Keywords: Energy transformations; Physical chemistry. (jg)

DESCRIPTORS: (U)   *CHEMISTRY, *ENERGETIC PROPER~IES,
*MATERIALS, ENERGY, EQUATIONS OF STATE, HIGH PRESSURE,
MOLECULAR STRUCTURE, NEW HAMPSHIRE, PHYSICAL CHEMISTRY,
PYROLYSIS, REACTIVITIES, SPECTROSCOPY, TRANSFORMATIONS.

IDENTIFIERS: (U)   WUAFOSR2303B2, PE61102F.

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AD-A221 545   7/2   20/2

AD-A221 545   CONTINUED

COLUMBIA UNIV NEW YORK DEPT OF ELECTRICAL ENGINEERING

GALLIUM, GERMANIUM, GROWTH(GENERAL), INDIUM PHOSPHIDES, INFRARED DETECTORS, MEASUREMENT, METASTABLE ALLOYS, MODULATION, PHASE TRANSFORMATIONS, SINGLE CRYSTALS, STRUCTURES, SUBSTRATES, SURFACES, THICK FILMS, THICKNESS, TIN, X RAY DIFFRACTION, X RAYS.

(U), 'Molecular Beam Epitaxial Growth, Characterization, and Devices of Modulated Semiconductor Structures'.

IDENTIFIERS: (U) WUAFOSR2917A3, PE61102F.

DESCRIPTIVE NOTE: Final rept. 1 Feb 89-31 Jan 90,

FEB 90   31P

PERSONAL AUTHORS: Wang, Wen I.

CONTRACT NO.   AFOSR-89-0215

PROJECT NO.   2917

TASK NO.   A3

MONITOR: AFOSR
TR-90-0480

UNCLASSIFIED REPORT

ABSTRACT: (U)   Substrate stabilized metastable single crystal germanium (1-x) stannide (x) films can be grown by molecular beam epitaxy (MBE). We have grown for the first time single crystal Ge (1-x) Sn(x) alloys on lattice matched gallium antimonide (with x=0.5) and indium phosphides substrates up to a thickness of 0.3 micrometer. Reflection high energy electron diffraction (RHEED) observations and x-ray measurements show that even at very small lattice mismatch, single crystal Ge(1-x)Sn(x) films cannot be grown thicker than 0.3 micrometer. Our x-ray results suggest that the critical thickness of alpha-Sn and Ge(1-x)Sn(x) single crystal films is mainly determined by a phase transition mechanism, and the dislocation generation equivalent critical thickness is an overestimate. Under practical MBE growth conditions, it is very difficult to grow thick films, due to the sensitivity of the critical thickness to composition fluctuations. We have shown that even under an exact lattice match between substrate and film, the critical film thickness is limited. Keywords: Metastable alloys; Single crystals; Germanium; Antimony; X-Ray diffraction; Aluminum; Gallium; Tin; Surface structure; Infrared detectors. (jg)

DESCRIPTORS: (U)   *EPITAXIAL GROWTH, *MOLECULAR BEAMS, *SEMICONDUCTORS, ALUMINUM, ANTIMONY, ENVIRONMENTS, FILMS,

AD-A221 545

AD-A221 544   20/8   8/4

AD-A221 544   CONTINUED

HARVARD UNIV CAMBRIDGE MA DIV OF APPLIED SCIENCES

(U) The Effects of Luminance Boundaries on Color
    Perception.

DESCRIPTIVE NOTE: Annual rept. 15 Mar 89-14 Mar 90,

APR 90   18P

PERSONAL AUTHORS: Kronauer, Richard E.; Eskew, R. T., Jr.
; Stromeyer, C. F., III

CONTRACT NO.   AFOSR-89-0304

PROJECT NO.   2313

TASK NO.   A5

MONITOR: AFOSR
    TR-90-0419

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *COLOR VISION, *LUMINANCE, *VISUAL
    PERCEPTION, BACKGROUND, BOUNDARIES, CHROMATICITY, COLORS,
    CONTOURS, DETECTION, FLASHES, LENGTH, MODELS,
    POSITION(LOCATION), PSYCHOPHYSIOLOGY, REGIONS, SIGNALS,
    SPATIAL DISTRIBUTION, TEST AND EVALUATION, THINNESS,
    THRESHOLD EFFECTS.

IDENTIFIERS: (U) WUAFOSR2313A5, PE61102F.

ABSTRACT: (U) When a suprathreshold luminance flash,
presented as an increment on a larger background field,
accompanies a circular equiluminant chromatic flash at
the same spatial location, the chromatic threshold is
reduced by about two-fold. This facilitation results from
the clearly-visible edges of the luminance flash (the
'pedestal') serving to demarcate the test region,
segregating it from its surround. Signal detection
experiments show that this facilitation does not occur
because the contour reduces the spatio-temporal detection
uncertainty of the observer. Partial and incomplete
luminance contours produce partial facilitation. An
illusory contour pattern can produce the full
facilitation effect, measured with a forced-choice method.
Recent experiments show that a thin luminance line which
bisects the test region produces weak facilitation, the
amount of which varies slightly with line length. This
result poses a challenge to simple models of the
facilitation mechanism, since the line does not demarcate
two differently colored regions. The facilitation effect
can be used as a rigorous means of probing the way in
which low-level visual attributes (edges, color) interact
at higher levels. Keywords: Psychophysiology; Visual
perception.

AD-A221 543   23/3   6/4

MASSACHUSETTS UNIV MEDICAL SCHOOL WORCESTER

(U) Non-Linear Analysis of Visual Cortical Neurons.

DESCRIPTIVE NOTE: Annual rept. no. 1, 1 Jan-31 Oct 89,

MAR 90   7P

PERSONAL AUTHORS: Jacobson, Lowell D.; Gaska, James P.;
Pollen, Daniel A.

CONTRACT NO.   AFOSR-89-0247

PROJECT NO.   2313

TASK NO.   A5

MONITOR: AFOSR
TR-90-0429

UNCLASSIFIED REPORT

ABSTRACT: (U)   During the first reporting period, new
equipment was purchased and set up and new software was
developed in preparation for electrophysiological
experiments to study the neural networks that underly the
binocular non-linear filtering properties of cells in the
monkey (Macaca fascicularis) visual cortex. This
preparatory task was completed. In addition, new methods
were developed for using input-output measurements to
identify multi-input nonlinear systems. These new
mathematical results have been written up and accepted
for journal publication and presented at two conferences.
In addition, the new system identification methods have
been applied in preliminary analyses of previously
obtained monocular stimulus-response data. Keywords:
Binocular vision; Nonlinear system identification; Neural
network. (JHD)

DESCRIPTORS: (U)   *MACACA FASCICULARIS, *NEURAL NETS,
*SPACE PERCEPTION, *VISUAL CORTEX, *VISUAL PERCEPTION,
COMPUTER PROGRAMS, ELECTROPHYSIOLOGY, EXPERIMENTAL DATA,
FILTERS, IDENTIFICATION, IDENTIFICATION SYSTEMS, INPUT,
MATHEMATICS, MULTIPLE OPERATION, NONLINEAR ANALYSIS,
NONLINEAR SYSTEMS, SYMPOSIA

IDENTIFIERS: (U)   WUAFOSR2313A5, PE61102F.

AD-A221 543

AD-A221 537   7/3

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

(U) Two Iron(0) Tricarbonyl Complexes with Substituted
Norbornadienes,

90   5P

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante; Kashyap,
Ram P.; Marchand, Alan P.; Dave, Paritosh

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0491

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallography, vC46
p24-27 1990.

ABSTRACT: (U)   The X-ray crystal structures of
tricarbonyl?2-3:5-6-eta-(dimethyl 8,9,10-triorborna-2,5-
diene-2,3-dicarboxylateiron(0), Fe(C11H1204)(CO)3 and
tricarbonyl2-3:5-6-eta-(dimethyl 7-trimethysilyl-8,9,10-
trinoborna-2,5-diene-2,3-dicarboxylateiron(0),
Fe(C14H2004Si)(CO)3 are reported. keywords: X-ray crystal
structure determination; Substituted (Norbornadiene)Fe(CO)
3 complexes: Reprints. (jg)

DESCRIPTORS: (U)   *CRYSTAL STRUCTURE, *PENTADIENES, *X
RAYS, CYCLIC COMPOUNDS, DETERMINATION, REPRINTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2. Norbornadienes.

AD-A221 537

DTIC REPORT BIBLIOGRAPHY

AD-A221 533   17/10   8/11

SOUTHERN METHODIST UNIV DALLAS TX DEPT OF GEOLOGICAL SCIENCES

(U) Equipment to Support the Development of High Resolution Geophysical Site Characterization Procedures.

DESCRIPTIVE NOTE: Final rept. 15 Dec 88-14 Dec 89,

FEB 90   24P

PERSONAL AUTHORS: Stump, Brian W.

CONTRACT NO.   AFOSR-89-0121

PROJECT NO.   3842

TASK NO.   A6

MONITOR: AFOSR
            TR-90-0487

UNCLASSIFIED REPORT

ABSTRACT: (U)   An important application of high resolution geophysical exploration is the interpretation of strong ground motions from chemical and nuclear explosions. High dynamic range data acquisition systems which are capable of acquiring multiple channels of data are necessary. Ground motion sensors, data analysis microsystem, and field enclosures were supported under this grant. Spanning ground motions from the low level exploration environment to the strong levels next to explosive sources was done with a collection of geophones, seismometers, and accelerometers. Four applications of the new system are given. In a range of experiments from quantification of near-source ground motions from a contained nuclear explosion to the characterization of a new AFOSR supported shear wave generator. Keywords: Seismic detection; Seismology; Compressional waves; Shear waves; Geophone; Accelerometer; Geophysical site characterization. (edc)

DESCRIPTORS: (U)   *GEOPHONES, *SEISMIC DETECTION, *SEISMOMETERS, ACCELEROMETERS, CHEMICAL ORDNANCE, DATA ACQUISITION, DATA PROCESSING, DETECTORS, SEISMIC WAVES, EXPLOSIVES, EXPLOSION EFFECTS, GENERATORS, GEOPHYSICAL PROSPECTING, GEOPHYSICS, GROUND MOTION, HIGH RESOLUTION,

AD-A221 533
    CONTINUED

LOW LEVEL, MICROELECTRONICS, NUCLEAR EXPLOSIONS, SEISMIC DATA, SEISMOLOGY, SHEAR PROPERTIES, SITES, SOURCES.

IDENTIFIERS: (U)   Shear waves, Compressional waves, Site characterization, PE61104D, WUAFOSR3842A6.

AD-A221 533

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 532   22/2   AD-A221 532   CONTINUED

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL AND COMPUTER   LINEAR SYSTEMS, MEASUREMENT, NOISE, OUTPUT, PERTURBATIONS,
ENGINEERING   PRECISION, PROBABILITY, THEORY, TIME.

(U) Aiming Control: Theory and Applications to Dynamic   IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1.
    Control of Space Structures.

DESCRIPTIVE NOTE: Final rept. 1 Aug 87-31 Jul 89,

    JUL 89   90P

PERSONAL AUTHORS: Meerkov, Semyon M.

CONTRACT NO.   F49620-87-C-0079

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0520

            UNCLASSIFIED REPORT

ABSTRACT: (U)   This report summarizes the results
obtained during the second year of the project. The goal
of the project as a whole is the investigation of
fundamental bounds on the maximal achievable precision of
aiming of dynamical systems with random perturbations and
application of these bounds to control of space
structures. To this end, during the second year of the
project the following results have been obtained: it has
been shown that linear systems with small additive noise
can be pointed with any desired accuracy by output
feedback if and only if the system is invertable and
minimum phase in an approximate sense; when the
measurements noise is present, the maximal achievable
precision of aiming is bounded, even if the conditions
mentioned above are satisfied; thus, the measurement
noise has a more severe effect on the pointability of
dynamical system than the input noise. In addition, the
problem of residence probability control has been
investigated and its relation to the problem of residence
time control has been analyzed. Aiming control, Large
deviations theory, Unmanned spacecraft, Residence time,
Pointing processes. (jes)

DESCRIPTORS: (U)   *UNMANNED SPACECRAFT, ACCURACY, AIMING,
CONTROL, DYNAMICS, FEEDBACK, HIGH RATE, INPUT, INTENSITY,

AD-A221 532   AD-A221 532

AD-A221 524   9/5

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) Picosecond Electronics and Optoelectronics. Technical
    Digest Held in Salt Lake City, Utah on 8-10 March 1989.

DESCRIPTIVE NOTE: Final rept. 2 Jan 89-31 Jan 90.

JAN 90   168P

CONTRACT NO.   AFOSR-89-0266

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0413

           UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson
Place, N.W., Washington, DC 20036. PC $69.00. No copies
furnished by DTIC/NTIS.

ABSTRACT: (U)   The Optical Society of America sponsors
topical meeting on subjects in which many rapid advances
are taking place so that contributors to the field may
interchange ideas to their mutual benefit. The Photonic
Science Topical Meeting Series included the following
subjects: a) Nonlinear Guided Wave Phenomena: Physics and
Applications, b) Microphysics of Surfaces, Beams and
Adsorbates, c) Optical Computing, d) Photonic Switching,
e) Quantum Wells for Optics and Optoelectronics, f)
Picosecond Electronics and Optoelectronics, g) High
Intensity Laser Radiation on Atoms and Surfaces, h)
Quantum Limited Imaging and Information Processing, and i)
Signal Recovery and Synthesis. (RH)

DESCRIPTORS: (U)   *ELECTROOPTICS, ATOMS, COMPUTATIONS,
ELECTRONICS, HIGH RATE, IMAGES, INFORMATION PROCESSING,
INTENSITY, LASER BEAMS, NONLINEAR SYSTEMS, OPTICAL
PROCESSING, OPTICS, PHOTONS, PHYSICS, QUANTUM ELECTRONICS,
QUANTUM THEORY, RADIATION, RECOVERY, SIGNALS, SURFACES,
SWITCHING, SYNTHESIS, WAVEGUIDES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2301A1.

AD-A221 524

AD-A221 522   8/1

ROCHESTER UNIV MEDICAL CENTER NY DEPT OF PHARMACOLOGY

(U) Biosynthesis, Physiological Disposition, and
    Biochemical Effects of Nephrotoxic Glutathione and
    Cysteine S-Conjugates.

DESCRIPTIVE NOTE: Final technical rept. 15 Aug 85-14 Feb
90,

APR 90   6P

PERSONAL AUTHORS: Anders, M. W.

CONTRACT NO.   AFOSR-86-0302

PROJECT NO.   2312

TASK NO.   A5

MONITOR: AFOSR
           TR-90-0494

           UNCLASSIFIED REPORT

ABSTRACT: (U)   These studies established that the
biosynthesis of S-(pentachlorobutadienyl)glutathione
(PCBG) is catalyzed preferentially by hepatic microsomal
gluathione S-transferases. PCBG is further metabolized to
the diconjugate 1,4-bis(glutathion-S-yl)-1,2,3,4-
tetrachlorobuta-1,3-diene by hepatic cytosolic
transferases. Studies on the synthesis of PCBG in the
isolated, perfused rat liver showed that PCBG is
eliminated in the bile at toxicologically relevant doses.
The cysteine analog of PCBG S-(pentachlorobutadienyl)-L-
cysteine (PCBC) is a potent nephrotoxin that damages
mitochondria. PCBC, which is activated by renal
mitochondrial cysteine conjugate Beta-lyase, inhibits
mitochondrial protein, DNA, and RNA synthesis and
destroys mitochondrial DNA, although the role of the
effects in the observed mutagenicity of PCBC is unclear.
Finally, preliminary studies on the intestinal absorption
of PCBG indicate that the intact glutathione S-conjugate
is absorbed in vivo and is cultured CaCo cells. (jes)

DESCRIPTORS: (U)   ABSORPTION, ANALOG SYSTEMS, BILE,
BIOCHEMISTRY, BIOSYNTHESIS, CYSTEINE, DEOXYRIBONUCLEIC
ACIDS, DOSAGE, IN VIVO ANALYSIS, INTESTINES, LIVER,
MITOCHONDRIA, PROTEINS, RATS, RIBONUCLEIC ACIDS.

AD-A221 522

AD-A221 522   CONTINUED

SYNTHESIS.

AD-A221 517.   22/1

FLORIDA ATLANTIC UNIV BOCA RATON

(U) Stochastic Structural Dynamics for Aerospace
     Applications.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-30 Dec 89,

MAR 90   72P

PERSONAL AUTHORS: Lin, Y. K.

CONTRACT NO.   AFOSR-88-0005

PROJECT NO.   2302

TASK NO.   B1

MONITOR: AFOSR
             TR-90-0446

UNCLASSIFIED REPORT

ABSTRACT: (U)   Three technical areas are addressed: (1) A
new general theory is developed to predict the response
of a truss-type space structure under arbitrary loading
using the concept of wave propagation and scattering in
piece-wise periodic structures. (2) The effects of random
imperfection (or disorder) are taken into account based
on assumed spatial ergodicity property of the imperfect
periodic truss units. The random disorder has the
tendency to inhibit wave propagation, quantified by a
localization factor. A scheme is devised to permit
successive improvement of accuracy in the computation of
localization factor, making it applicable to all
practical cases regardless of the relative measures
between disorder and the internal coupling. (3) New exact
and approximate solution techniques are developed for
nonlinear dynamical systems under random excitation. The
exact solution technique is based on separation of
probability flow into the potential flow and the
circulatory flow. Approximate solution is obtained under
a statistical criterion that the average dissipation
energy remains the same for the original system and a
substituting system which is exactly solvable. Keywords:
Vibration localization, Nonlinear random vibration. (KR)

DESCRIPTORS: (U) *AEROSPACE SYSTEMS, *STRUCTURAL
RESPONSE, *TRUSSES, ACCURACY, CIRCULATION,

AD-A221 517

AD-A221 522

AD-A221 517   CONTINUED

COUPLING(INTERACTION), DISSIPATION, DYNAMICS, ENERGY,
ERGODIC PROCESSES, EXCITATION, FLOW, INTERNAL, NONLINEAR
SYSTEMS, ORDER DISORDER TRANSFORMATIONS, POTENTIAL FLOW,
PROBABILITY, RANDOM VIBRATION, SCATTERING,
SOLUTIONS(GENERAL), SPATIAL DISTRIBUTION, STOCHASTIC
PROCESSES, STRUCTURAL PROPERTIES, THEORY, VIBRATION, WAVE
PROPAGATION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2302B1.

AD-A221 516   20/8   20/6

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) Microphysics of Surfaces, Beams and Adsorbates. 1989
    Technical Digest Series, Volume 8.

DESCRIPTIVE NOTE: Final rept. 1 Feb 89-31 Jan 90.

JAN 90   116P

CONTRACT NO.   AFOSR-89-0286

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0417

                UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson
Place, N.W. Washington, DC 20036. PC$62.00. No copies
furnished by DTIC/NTIS.

SUPPLEMENTARY NOTE: Summaries of papers presented at the
Microphysics of Surfaces, Beams and Adsorbates Topical
Meeting, 27 Feb-1 Mar 89, Salt Lake City, Utah.

ABSTRACT: (U)   The Optical Society of America sponsors
topical meeting on subjects in which many rapid advances
are taking place so that contributors to the field may
interchange ideas to their mutual benefit. The Photonic
Science Topical Meeting Series included the following
subjects: Nonlinear Guided Wave Phenomena: Physics and
Applications, Microphysics of Surfaces, Beams and
Adsorbates, Optical Computing, Photonic Switching,
Quantum Wells for Optics and Optoelectronics, Picosecond
Electronics and Optoelectronics, High Intensity Laser
Radiation on Atoms and Surfaces, Quantum Limited Imaging
and Information Processing, and Signal Recovery and
Synthesis. Symposia; Photons; Electromagnetic; Radiation;
Light; Gamma rays; X-rays; Physics; Optics. (jg)

DESCRIPTORS: (U)   *PHYSICS, *SURFACES, *BEAMS(RADIATION),
*ADSORBATES, ATOMS, COMPUTATIONS, ELECTRONICS,
ELECTROOPTICS, GAMMA RAYS, HIGH RATE, IMAGES, INFORMATION
PROCESSING, INTENSITY, LASER BEAMS, NONLINEAR SYSTEMS,
OPTICAL PROCESSING, OPTICS, PHOTONS, QUANTUM ELECTRONICS,

AD-A221 516

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AD-A221 516   CONTINUED   AD-A221 515   6/1

                                            IOWA UNIV IOWA CITY DEPT OF MICROBIOLOGY

QUANTUM THEORY, RADIATION, RECOVERY, SIGNALS, SWITCHING,
SYMPOSIA, SYNTHESIS, WAVEGUIDES.   (U) Trichloroethylene Degradation by 'Escherichia coli'
                                                 Containing the Cloned 'Pseudomonas putida' F1 Toluene
IDENTIFIERS: (U) PE61102F, WUAFOSR2301/1.   Dioxygenase Genes,

                                            DEC 89   6P

                                            PERSONAL AUTHORS: Zylstra, Gerben J.; Wackett, Lawrence P.
                                            ; Gibson, David T.

                                            CONTRACT NO. AFOSR-88-0225

                                            PROJECT NO.   2303

                                            TASK NO.   B2

                                            MONITOR: AFOSR
                                                       TR-90-0444

                                                       UNCLASSIFIED REPORT

ABSTRACT: (U)   Toluene dioxygenase from Pseudomonas
putida F1 has been implicated as an enzyme capable of
degrading trichloroethylene. This has now been confirmed
with Escherichia coli JM109(pDTG601) that contains the
structural genes (todC1C2BA) of toluene dioxygenase under
the control of the tac promoter. The extent of
trichloroethylene degradation by the recombinant organism
depended on the cell concentration and the concentration
of trichloroethylene. A linear rate of trichloroethylene
degradation was observed with the E. coli recombinant
strain. In contrast, P. putida (F39/D, a mutant strain of
P. putida F1 that does not contain cis-toluene
dihydrodiol dehydrogenase, showed a much faster initial
rate of trichloroethylene degradation which decreased
over time. (jes)

DESCRIPTORS: (U) *ESCHERICHIA COLI DEGRADATION, ENZYMES,
GENES, LINEARITY, RATES, STRUCTURAL PROPERTIES,
TRICHLOROETHYLENE.

AD-A221 515

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DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 515   CONTINUED

IDENTIFIERS: (U) WUAFOSR2303B2, PE61102F.

AD-A221 512   20/3

WISCONSIN UNIV-MADISON DEPT OF PHYSICS

(U) Research on Optogalvanic Effects.

DESCRIPTIVE NOTE: Final rept. 30 Sep 84-30 Sep 89,

DEC 89   74P

PERSONAL AUTHORS: Lawler, J. E.

CONTRACT NO.   AFOSR-84-0328

PROJECT NO.   2301

TASK NO.   A7

MONITOR: AFOSR
           TR-90-0440

UNCLASSIFIED REPORT

ABSTRACT: (U)   Highly accurate elective field maps, gas
density measurements, and a model of ion transport were
combined to determine the current balance at the surface
of a cold aluminum cathode. The ratio of ion to electron
current was found to be 3.3 at the cathode surface. This
ratio is independent of total discharge current from a
near normal cathode fall of 173V to a highly abnormal
cathode fall of 800V. (rh)

DESCRIPTORS: (U) *CATHODES, ABNORMALITIES, ALUMINUM,
BALANCE, COLD CATHODE TUBES, DENSITY, ELECTRIC CURRENT,
ELECTRIC DISCHARGES, ELECTRONS, FIELD EQUIPMENT, GASES,
ION EXCHANGE, MAPS, MEASUREMENT, MODELS, RATIOS, SURFACES.

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7.

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AD-A221 515

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 509   6/1

EAST CAROLINA UNIV SCHOOL OF MEDICINE GREENVILLE NC

(U) Effects of Calcium Antagonists on the Evoked Release of Dynorphin A(1-8) and Availability of Intraterminal Calcium in Rat Hippocampal Mossy Fiber Synaptosomes,

89   7P

PERSONAL AUTHORS: Terrian, D. M.; Damron, D. S.; Dorman, R. V.; Gannon, R. L.

CONTRACT NO.   AFOSR-89-0531

PROJECT NO.   2312

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0431

UNCLASSIFIED REPORT

ABSTRACT: (U)   Multiple types of presynaptic voltage-sensitive calcium channels (VSCCs) may contribute to the Ca influx that initiates neurotransmitter release in the mammalian central nervous system. Three subtypes of neuronal Ca channels have now been identified and characterized (i.e. T, Na and L type) (9). Recently, it was demonstrated that the evoked release of biogenic amines from whole brain synaptosomes (10) and that evoked release of biogenic amines from whole brain synaptosomes (10) and hippocampal slices (3) is potentially inhibited by w-conotoxin GVIA, an N-type channel blocker but relatively insensitive to antagonists of the L-type VSCCs, such as the dihydropyridine derivatives (DHPs). Therefore, the N-type VSCC may make the most substantial contribution to the release of biogenic amine neurotransmitters. In contrast, the secretion of neuropeptide hormones (i.e. vasopressin and oxytocin) from neurohypophysial synaptosomes appears to require the activation of DHP-sensitive VSCCs(1). This finding has led to the suggestion that Ca entry via L-type channels may be required for the release of neuropeptides from

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AD-A221 509   CONTINUED

central neurons. In the hippocampal mossy fiber (MF) system, prodynorphin-derived peptides are thought to play a neurotransmitter role and this excitatory synaptic input to CA3 pyramidal neurons is depressed by at least two different types of Ca channel blockers, and phenytoin. (JES)

DESCRIPTORS: (U)   *SYNAPSE, *HIPPOCAMPUS, AMINES, CALCIUM, CENTRAL NERVOUS SYSTEM, INPUT, MAMMALS, NERVE CELLS, NERVE TRANSMISSION, NERVES, NEUROMUSCULAR TRANSMISSION, PEPTIDES, PHARMACOLOGICAL ANTAGONISTS, PITUITARY HORMONES, RELEASE.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2312A2.

AD-A221 509

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 502   20/8

ARIZONA UNIV TUCSON DEPT OF MATHEMATICS

(U) Transition to Complicated Behavior in Infinite
     Dimensional Dynamical Systems.

DESCRIPTIVE NOTE: Final rept. 15 Sep 86-29 Sep 89,

MAR 90   81P

PERSONAL AUTHORS: Newell, Alan C.

CONTRACT NO.   F49620-86-C-0130

PROJECT NO.   3484

TASK NO.   A5

MONITOR: AFOSR
           TR-90-C506

UNCLASSIFIED REPORT

ABSTRACT: (U)   The main goal of the research is to
understand nonlinear processes in natural phenomena.
There is a strong emphasis on nonlinear optics, a subject
which is relatively young and extremely rich in
scientific and technological potential. Turbulence in
optics, the study of the complex space-time patterns and
defects which appear in feedback cavities and
counterpropagating beams, is more analytically tractable
than its counterpart in fluids, and is currently
international attention. It is the subject of our latest
workshop. The primary goal of the Center is to provide an
environment for research and learning in the Mathematical
Sciences. Its basic research themes are the modelling,
understanding and applicability of nonlinear processes in
optics, fluids, neural networks, and random distributed
systems with continuing investigations into pattern
dynamics, percolation, behavior of lattice gases,
nonlinear stability, low dimensional chaos, turbulence,
dynamical systems and the nature of integrable systems of
differential equations. (KR)

DESCRIPTORS: (U)   *NONLINEAR SYSTEMS, *OPTICAL PHENOMENA,
*OPTICS, ATTENTION, BEAMS(RADIATION), CAVITIES,
DIFFERENTIAL EQUATIONS, DISTRIBUTION, DYNAMICS, FEEDBACK,
FLUIDS, INTERNATIONAL, LEARNING, MATHEMATICS, NEURAL NETS,
PATTERNS, PERCOLATION, PROPAGATION, STABILITY, TURBULENCE.

AD-A221 502

IDENTIFIERS: (U)   PE61102F, WUAFOSR3484A5.

AD-A221 502   CONTINUED

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 499   6/11   6/1   AD-A221 499   CONTINUED

ILLINOIS UNIV AT URBANA

(U) The Mechanisms and Effects of the Plant Activation of
    Chemicals in the Environment.

DESCRIPTIVE NOTE: Technical rept. 20 Sep 89-20 Mar 90,

    APR 90   23P

PERSONAL AUTHORS: Plewa, Michael J.

CONTRACT NO.   AFOSR-88-0336

PROJECT NO.   2312

TASK NO.   A4

MONITOR: AFOSR
            TR-90-0493

UNCLASSIFIED REPORT

DESCRIPTORS: (U)   *BIOCHEMISTRY, *ENVIRONMENTAL IMPACT,
*FOOD CHAINS, *MUTAGENS, ACTIVATION, ALGAE, CELLS(BIOLOGY)
, INDUCED ENVIRONMENTS, CONCENTRATION(COMPOSITION),
ENZYME INHIBITORS, ENZYMES, EXPOSURE(GENERAL), FRESH
WATER, FUNCTIONS, HUMANS, INHIBITORS, LOW LEVEL,
MICROSCOPY, OBSERVATION, SUBSTRATES, TOBACCO PLANTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2312A4.

ABSTRACT: (U)   The demonstration that plants can activate
chemicals into mutagens raises the concern that plants
might activate environmental agents and introduce
genotoxins into the human food chain. This project
concentrated on the following research objectives. 1) The
comparison of the plant activation of specific mono- and
polycyclic aromatic amines (2-aminofluorene and m-
phenylenediamine) by cultured plant cells and fresh water
algae. 2) The investigation of the biochemical mechanisms
of plant activation by the use of specific enzyme
inhibitors. 3) The determination if specific inhibitors
that constrain the activation of the substrates function
by competitive or noncompetitive inhibition. 2-
aminofluorene is a more potent promutagen than m-
phenylenediamine. As little as 25 nmol 2-aminofluorene/
reaction tube caused a significant increase in mutant
TA98 cells. S. capricornutum did not activate m-
phenylenediamine at concentration ranges similar to those
used for the TX1 studies, although 2-aminofluorene was
weakly activated. Both agents appeared to be non-toxic at
the highest concentrations, based on microscopic
observation of the algal cells after exposure to the
chemicals. Under the conditions tested, it was concluded
that the enzyme system(s) responsible for the activation
of these chemicals in tobacco cells is either at low
concentrations or inactive in the algal cells. (JHD)

AD-A221 499   AD-A221 499

AD-A221 484   7/4

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) Acetic Acid Adsorption on Smooth Pt Electrodes.
Measuring the Rate of Double-Layer Organization and
Rearrangement.

DESCRIPTIVE NOTE: Rept. for May 88-Apr 90,

89   11P

PERSONAL AUTHORS: Krauskopf, E. K.; Wieckowski, A.

CONTRACT NO.   AFOSR-89-0368

PROJECT NO.   2303

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0453

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. Electroanal Chem., v271
p295-304 1989.

ABSTRACT: (U)   Acetic acid adsorption on platinum was
used as a probe of the structure of the electrical double
layer containing reversibly interacting surface
components. The critical role of the electrode potential
in bonding and surface equilibria is illuminated. It is
concluded that adsorption of acetic acid occurs on the
top of an intermediate water monolayer adsorbed directly
onto the electrode surface. The mechanism of acetic acid
desorption through 'desorption stimulated by adsorption'
is discussed. Reprints; Thermodynamics; Single crystal electrodes;
Platinum; Thermodynamics; Single crystal electrodes;
Bonding and lateral energies; Electrosorption; CH3COOH;
Polycrystalline. (jg)

DESCRIPTORS: (U)   *ACETIC ACID, *ADSORPTION, *ELECTRODES,
*PLATINUM, DESORPTION, ELECTRIC DOUBLE LAYER,
INTERACTIONS, LAYERS, ORGANIZATIONS, PHYSICAL CHEMISTRY,
PROBES, RATES, REPRINTS, SINGLE CRYSTALS,
STIMULATION(GENERAL), SURFACES, THERMODYNAMICS, WATER
MASSES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A1.

AD-A221 484

AD-A221 483   5/6

PRINCETON UNIV NJ SCHOOL OF ENGINEERING AND APPLIED
SCIENCE

(U) AFRAPT Trainee Program.

DESCRIPTIVE NOTE: Final technical rept. 1 Sep 88-31 Aug
89,

APR 90   3P

PERSONAL AUTHORS: Glassman, Irvin; Goddard, R. H.

CONTRACT NO.   AFOSR-88-0342

PROJECT NO.   2308

TASK NO.   A2

MONITOR: AFOSR
           TR-90-0445

UNCLASSIFIED REPORT

ABSTRACT: (U)   Air Force Research in Aero Propulsion
Technology (AFRAPT) students were in residence in
Princeton University's Department of Mechanical and
Aerospace Engineering during the subject period. Two
continue their studies and one completed his M.S.E.
thesis and accepted a position in the Gas Turbine
Division of General Electric Co. Cincinnati, OH.
Keywords: Aero propulsion technology trainee.

DESCRIPTORS: (U)   *AERONAUTICAL ENGINEERING, *AEROSPACE
SYSTEMS, *TRAINEES, AIR FORCE RESEARCH, STUDENTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A2.

AD-A221 483

AD-A221 481   6/4   AD-A221 481   CONTINUED

MCGILL UNIV MONTREAL (QUEBEC)   IDENTIFIERS: (U)   PE61102F, WUAFOSR2313A8.

(U) Curvature Estimation in Orientation Selection.

DESCRIPTIVE NOTE: Annual technical rept. 1 Feb 89-31 Jan
90,

MAR 90   5P

PERSONAL AUTHORS: Zucker, Steven W.; Cunader, Max S.

CONTRACT NO.   AFOSR-89-0260

PROJECT NO.   2313

TASK NO.   A8

MONITOR: AFOSR
            TR-90-0422

            UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with the Dept.
of Opthalmology, University of British Columbia Vancouver,
B. C.

ABSTRACT: (U)   This research effort is concentrated on
the computational neuroscience of early vision. Progress
was made on the following problems: (i) a model of end-
stopped visual cortical neurons was extended to include
complex components; (ii) an extensive simulation of the
model was completed with regard to orientation,
positional, spatial frequency, curvature, chevron, and
end-line sensitivity; (iii) orientation discontinuities
were extended into the motion domain, and psychophysical
and computational experiments confirm the hypothesis of
multiple directions being represented at a point of
discontinuity; and (iv) the mathematical foundations were
laid for a theory of shape. Several new projects were
also initiated. Keywords: Neurophysiology; Spatial
distribution.

DESCRIPTORS: (U)   *NEUROPHYSIOLOGY, *SPATIAL DISTRIBUTION,
*VISION, COMPUTATIONS, CURVATURE, DISCONTINUITIES,
ESTIMATES, FREQUENCY, HYPOTHESES, MATHEMATICS, MODELS,
MOTION, ORIENTATION(DIRECTION), POSITION(LOCATION),
PSYCHOPHYSICS, SELECTION, SHAPE, SIMULATION, TEST METHODS,
THEORY.

AD-A221 481   AD-A221 481

AD-A221 480   8/1   8/11

MICHIGAN STATE UNIV EAST LANSING DEPT OF PEDIATRICS/
HUMAN DEVELOPMENT

(U) The Role of Chemical Inhibition of Gap-Junctional
   Intercellular Communication in Toxicology.

DESCRIPTIVE NOTE: Annual technical rept. 1 Mar 89-31 Mar
90.

MAR 90   9P

PERSONAL AUTHORS: Trosko, James E.

CONTRACT NO.   AFOSR-89-0325

PROJECT NO.   2312

TASK NO.   AS

MONITOR: AFOSR
            TR-90-0462

            UNCLASSIFIED REPORT

ABSTRACT: (U)   Progress during the first 12 months of
this grant has progressed on all six specific aims,
namely to study the basic mechanisms by which toxic
chemicals block cell-cell communication; role of
oncogenes in down-regulating gap junctional intercellular
communication (GJIC); how protein kinase C enzyme, after
activated by chemicals, down regulates GJIC; validate
known toxic chemicals' ability to block GJIC in new human
cell lines; isolate gap junction antibodies to
characterize and study how gap junctions are regulated;
and to isolate and characterize gap junction mutants.
Several experimental, theoretical and review articles
have been submitted. Presented research at recent
international meetings and several national meetings. Gap
junctions; Cell communication; Tumor promoters;
Teratogens; Neurotoxins; Protein kinase C; Chemical-
toxicity; Biochemistry; Carcinogens. (jg)

DESCRIPTORS: (U)   *CELLS, *CHEMICAL REACTIONS,
*INHIBITION, *TOXICITY, ACTIVATION, BIOCHEMISTRY,
CARCINOGENS, CHEMICAL AGENTS, CHEMICALS, INTERNATIONAL,
NEOPLASMS, NEUROTOXINS, SYMPOSIA.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2312AS.

AD-A221 480

AD-A221 470   20/3   9/5   20/6   9/3
               20/10

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) Optical Computing. 1989 Technical Digest Series.
   Volume 9. Conference Edition.

DESCRIPTIVE NOTE: Final rept. 1 Feb 89-31 Jan 90.

JAN 90   481P

CONTRACT NO.   AFOSR-89-0288

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0418

            UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson
Place, NW., Washington, DC 20036. PC $70.00. No copies
furnished by DTIC/NTIS.

ABSTRACT: (U)   The Optical Society of America sponsors
topical meeting on subjects in which many rapid advances
are taking place so that contributors to the field may
interchange ideas to their mutual benefit. The Photonic
Science Topical Meeting Series included the following
subjects: a) Nonlinear Guided Wave Phenomena: Physics and
Applications, b) Microphysics of Surfaces, Beams and
Adsorbates, c) Optical Computing, d) Photonic Switching,
e) Quantum Wells for Optics and Optoelectronics, f)
Picosecond Electronics and Optoelectronics, g) High
Intensity Laser Radiation on Atoms and Surfaces, h)
Quantum Limited Imaging and Information Processing, and i)
Signal Recovery and Synthesis. Symposia. (jhd)

DESCRIPTORS: (U)   *COMPUTER ARCHITECTURE, *OPTICAL
PROCESSING, *QUANTUM ELECTRONICS, *OPTICAL CIRCUITS,
ATOMS, COMPUTATIONS, ELECTROOPTICS, INFORMATION
PROCESSING, HIGH INTENSITY, LASER BEAMS, NONLINEAR
SYSTEMS, PHOTONS, QUANTUM THEORY, OPTICAL SWITCHING,

AD-A221 470

AD-A221 470   CONTINUED

SYMPOSIA, WAVEGUIDES.

IDENTIFIERS: (U)   WUAFOSR2301A1, PE61102F, Optical
Computing.

AD-A221 466   12/3   5/1   17/9

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) A Hypothesis Test of Cumulative Sums of Multinomial
Parameters.

DESCRIPTIVE NOTE: Technical rept.,

FEB 90   39P

PERSONAL AUTHORS: Clair, J. H.; Meeter, D. A.

REPORT NO.   TR-90-247

CONTRACT NO.   AFOSR-88-0040

PROJECT NO.   2304

TASK NO.   A5

MONITOR: AFOSR
           TR-90-0426

UNCLASSIFIED REPORT

ABSTRACT: (U)   The Air Force is considering the contract
renewal application of a civilian contractor hired to
maintain in working order a series of radar stations. The
measure of performance of interest is T, the time that a
particular station is not 'on line' while being down for
repair. The contract stipulates that repair service will
be such that on the average 50% of all repairs will be
completed before L sub 1 hours and 90% of all repairs
shall be completed before L sub 2 hours. It also states
that the repair contract will be renewed on the basis of
a decision rule that errors by failing to renew when the
case is that the contract should be renewed with a
probability of alpha. The renewal of the contract depends
on the making a decision based on N repair times, T sub 1,
T sub 2, ..., T sub N, of the contractor as to whether or
not L sub 1 is at least the 50 to the th power percentile
and L sub 2 is at least the 90 to the th power percentile
of F(.), the distribution function F(.) of these repair
times. The usual test based on the binomial distributions
of the number of repairs before L sub 1 and the number of
repairs before L sub 2 suffers from two problems: 1) Its
true size is at times far from the nominal size; and 2)
because of the discrete of the random variables, cannot
be performed at the stipulated size. This paper proposes

AD-A221 466   CONTINUED

the use of the likelihood ratio test based on the multinomial joint distribution of the number of repairs before L sub 1 and the number of repairs before L sub 2. (kr)

DESCRIPTORS: (U) *STATISTICAL TESTS, *PARAMETERS, *RADAR STATIONS, AIR FORCE, BINOMIALS, CONTRACTORS, CONTRACTS, DECISION THEORY, DISTRIBUTION, HYPOTHESES, RANDOM VARIABLES, REPAIR, SIZES(DIMENSIONS), TEST AND EVALUATION.

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F, *Multinomial parameters.

AD-A221 465   7/4   12/1

GORDON RESEARCH CONFERENCES INC KINGSTON RI

(U) Gordon Research Conference on Computational Chemistry Held in Plymouth, New Hampshire on 4-8 July 1988.

DESCRIPTIVE NOTE: Final rept.,

JUL 88   20P

PERSONAL AUTHORS: Boyd, Donald B.; Kollman, Peter

CONTRACT NO.   AFOSR-88-0193

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0470

UNCLASSIFIED REPORT

ABSTRACT: (U)   A Gordon Research Conference on Computational Chemistry was held at Plymouth State College 4-8 July 1988. A broad range of topics were covered in some depth: macromolecular simulations (molecular dynamics) of proteins and lipids, charge polarizability, protein folding, free energy perturbation calculations, conformational analysis of drug-sized molecules, molecular mechanics, pharmacophore mapping, computer-assisted molecular design, distance geometry, applied quantum mechanics at the ab initio and semiempirical levels, quantitative structure-property relationships, and electronic and conformational properties of inorganics and solids. Symposia; Computations; Chemical analysis; Mathematical analysis; Molecular structure; Reactions. (jg)

DESCRIPTORS: (U)   *CHEMISTRY, *COMPUTATIONS, *MOLECULAR STRUCTURE, APPLIED MECHANICS, CHEMICAL ANALYSIS, COMPUTER APPLICATIONS, DYNAMICS, FOLDING, FREE ENERGY, GEOMETRY, INORGANIC MATERIALS, LIPIDS, MACROMOLECULES, MATHEMATICAL ANALYSIS, MECHANICS, MOLECULAR PROPERTIES, MOLECULES, PERTURBATIONS, PHYSICAL PROPERTIES, POLARIZATION, PROTEINS, QUANTUM THEORY, RANGE(DISTANCE), SIMULATION, SOLIDS, SYMPOSIA.

IDENTIFIERS: (U)   WUAFOSR2303R2, PE61102F.

AD-A221 465

AD-A221 466

AD-A221 463   12/1   20/2   11/6.1   21/2

CALIFORNIA UNIV LOS ANGELES DEPT OF MATHEMATICS

(U) Algorithms to Solve Nonlinear Time Dependent Problems of Engineering and Physics.

DESCRIPTIVE NOTE: Final rept. 1 Aug 86-31 May 89,

JUN 89   5P

PERSONAL AUTHORS: Case, J.; Widder, E.; Cook, D.

CONTRACT NO.   F49620-86-C-0115

PROJECT NO.   5783

TASK NO.   A9

MONITOR: AFOSR
TR-89-1200

UNCLASSIFIED REPORT

ABSTRACT: (U)   During this last year Osher developed a joint project with James Sethian concerning fronts propagating with curvature dependent speed. They devised new algorithms approximating the equations of motion, which resemble Hamilton-Jacobi equations with parabolic right-hand sides, by using techniques from hyperbolic conservation laws. Essentially non-oscillatory schemes are used. These methods accurately capture the formation of sharp gradients and cusps in the moving fronts. The algorithms handle topological merging and breaking naturally, and work in any number of space dimensions. The methods can also be used for more general Hamilton-Jacobi type problems. Applications of the algorithms include crystal growth, solidification of metals and flame propagation. (kr)

DESCRIPTORS: (U)   *ALGORITHMS, *CRYSTAL GROWTH, *FLAME PROPAGATION, *METALS, CONSERVATION, CURVATURE, EQUATIONS OF MOTION, GRADIENTS, HYPERBOLAS, PROBLEM SOLVING, NONLINEAR SYSTEMS, PARABOLAS, PHYSICS, SHARPNESS, SIDES, SOLIDIFICATION, TIME DEPENDENCE, VELOCITY.

IDENTIFIERS: (U)   WUAFOSR5783A9, PE61102F.

AD-A221 463

AD-A221 446   20/6   12/9

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) Signal Recovery and Synthesis III. 1989 Technical Digest Series, Volume 15. Conference Edition.

DESCRIPTIVE NOTE: Final rept. 1 Feb 89-31 Jan 90.

JAN 90   195P

CONTRACT NO.   AFOSR-89-0268

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
TR-90-0411

UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson Place, NW, Washington, DC 20036, PC$62.00.

SUPPLEMENTARY NOTE: Summaries of papers presented at the Signal Recovery and Synthesis III Topical Meeting, June 14-16, 1989, North Falmouth, Cape Cod, Massachusetts.

ABSTRACT: (U)   Topics include: Image restoration; Superresolution/deconvolution; Phase retrieval; Phase reconstruction; Tomography. Keywords: Photonics; Signal processing; Optical signals; Holography. (edc)

DESCRIPTORS: (U)   *SIGNAL PROCESSING, HOLOGRAPHY, IMAGE RESTORATION, OPTICS, PHASE, RECOVERY, RESOLUTION, SIGNALS. SYMPOSIA, TOMOGRAPHY.

IDENTIFIERS: (U)   Photonics, Optical signals, Superresolution, Deconvolution, Phase reconstruction. PE61102F, WUAFOSR2301A1.

AD-A221 446

AD-A221 437   20/5

GORDON RESEARCH CONFERENCES INC KINGSTON RI

(U) The Gordon Research Conference on Electron
    Spectroscopy Held in Wolfeboro, New Hampshire on 18-22
    July 1988.

DESCRIPTIVE NOTE: Final rept.,

JUL 88   17P

PERSONAL AUTHORS: Pierce, Daniel T.; McKoy, Vince

CONTRACT NO.   AFOSR-88-0193

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0475

UNCLASSIFIED REPORT

ABSTRACT: (U)   A Gordon Research Conference on the
Electron Spectroscopy was held at the Brewster Academy 18-
22 July 1988. There were 100 attendees. A broad range of
modern techniques were covered, including various
combinations of excitation sources, targets, and
detectors. Yet the conference uses electron spectroscopy
as a common thread to draw together and focus diverse
approaches to frontier research topics. There were 21
speakers who were recognized leaders in their technology
areas. There were 30 poster papers on diverse topics.
Atomic and molecular physics, Symposia, Chemical analysis,
Research management. (jg)

DESCRIPTORS: (U)   *ELECTRON SPECTROSCOPY, CHEMICAL
ANALYSIS, DETECTORS, EXCITATION, MOLECULAR STRUCTURE,
NUCLEAR PHYSICS, RESEARCH MANAGEMENT, SOURCES, SYMPOSIA.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2.

AD-A221 437

AD-A221 435   12/6

RUTGERS - THE STATE UNIV NEW BRUNSWICK NJ LAB FOR
COMPUTER SCIENCE RESEARCH

(U) Architectures for Optical Computing.

DESCRIPTIVE NOTE: Final rept. 1 Sep 86-31 Jan 90,

JAN 90   108P

PERSONAL AUTHORS: Levy, Saul

CONTRACT NO.   AFOSR-86-0294

PROJECT NO.   2305

TASK NO.   B7

MONITOR: AFOSR
            TR-90-0425

UNCLASSIFIED REPORT

ABSTRACT: (U)   The activities of the CAM group are
recorded herein. These consist of the development of
several experimental software systems on an AMT DAP
(Distributed Array Processor) for evaluation and research
purposes. The resulting determinations of the strengths
and weakness of the DAP are discussed. Two new machine
architectures were developed in an attempt to consolidate
the strengths and overcome the weaknesses. The effort led
to the analysis of certain parallel algorithms from a new
point of view, and thus to a new class of parallel
algorithms, the semi-serial algorithms. Keywords: Content
addressable memory, Parallel processing, Computer
architecture. (JHD)

DESCRIPTORS: (U)   *MEMORY DEVICES, *COMPUTER ARCHITECTURE,
*OPTICAL PROCESSING, ALGORITHMS, ARRAYS, COMPUTATIONS,
COMPUTER PROGRAMS, DATA PROCESSING EQUIPMENT, DISTRIBUTED
DATA PROCESSING, PARALLEL PROCESSING.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2305B1.

AD-A221 435

AD-A221 420   12/7

AD-A221 410   20/5   12/7

PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF COMPUTER SCIENCE

OREGON STATE UNIV CORVALLIS DEPT OF MECHANICAL ENGINEERING

(U) Practical Issues in the Complexity of Neural Networks.

(U) (DURIP) Spontaneous Raman System for the Study of Enhanced Combustion and Non-Thermal Plasmas.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov 90,

JAN 90   9P

FEB 90   6P

PERSONAL AUTHORS: Parberry, Ian; Berman, Piotr; Schnitger, Georg

PERSONAL AUTHORS: Peterson, Richard B.

CONTRACT NO.   AFOSR-89-0168

CONTRACT NO.   AFOSR-89-0093

PROJECT NO.   3842

PROJECT NO.   3842

TASK NO.   A2

TASK NO.   A1

MONITOR: AFOSR
TR-90-0385

MONITOR: AFOSR
TR-90-0467

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U)   The equipment purchased under this Grant was used to supplement the theoretical work done under AFOSR-87-0400 with experimental results. The primary use of the equipment was to perform experiments to aid in the generation and testing of theoretical hypotheses about neural networks, regarding the magnitude of synaptic weights, convergence of learning algorithms, computation and learning with bounded-precision analog neural networks, the performance of simulated annealing on structured problems, and the management of replicated data bases. Research is still underway to gather more experimental data and provide theoretical justification for the observations. Keywords: Neural networks, Complexity theory, Fault tolerance, Learning. (KR)

ABSTRACT: (U)   This report describes the instrumentation purchased on the DURIP grant AFOSR-89-0093 and the research work that this instrumentation will support. The objective of the grant was to acquire elements of a spontaneous Raman system for gas phase diagnostic work on currently funded combustion studies. Toward this end, we have acquired a neodymium: YAG pulsed laser with frequency doubling, an optical multichannel analyzer (OMA), a computer system required to operate the OMA, and a flat flame burner for validation and testing of the Raman set-up. Raman spectroscopy; Laser; OMA; Combustion ignition plasma; Computer systems; Logistics. (Jg)

DESCRIPTORS: (U)   *NEURAL NETS, ALGORITHMS, ANNEALING, CONVERGENCE, DATA BASES, EXPERIMENTAL DATA, FAULTS, HYPOTHESES, LEARNING, SIMULATION, THEORY, TOLERANCE.

DESCRIPTORS: (U)   *COMBUSTION, *PLASMAS(PHYSICS), ANALYZERS, BURNERS, COMPUTERS, DIAGNOSIS(GENERAL), IGNITION, LASERS, LOGISTICS, MULTICHANNEL, NEODYMIUM, OPTICAL EQUIPMENT, PULSED LASERS, RAMAN SPECTRA, RAMAN SPECTROSCOPY, VALIDATION, VAPOR PHASES, YAG LASERS.

IDENTIFIERS: (U)   WUAFOSR3842A2, PE61102F.

IDENTIFIERS: (U)   PE61104D, WUAFOSR3842A1.

AD-A221 420

AD-A221 410

AD-A221 401   7/8   7/4   14/2

AD-A221 394   5/8

MASSACHUSETTS UNIV AMHERST DEPT OF POLYMER SCIENCE AND
ENGINEERING

UTAH UNIV SALT LAKE CITY DEPT OF PSYCHOLOGY

(U) DURIP Advanced Polymer Solid State NMR Instrumentation.

(U) Attention Capture by Novel Stimuli.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,

DESCRIPTIVE NOTE: Annual technical rept. 1 Feb 89-31 Jan
90,

MAR 90   10P

JAN 90   46P

PERSONAL AUTHORS: Rice, David M.

PERSONAL AUTHORS: Johnston, William A.; Hawley, Kevin J.;
Plewe, Steven H.; Elliott, John M.; Dewitt, M. J.

CONTRACT NO.   AFOSR-89-0184

CONTRACT NO.   AFOSR-89-0275

PROJECT NO.   3842

PROJECT NO.   2313

TASK NO.   A2

TASK NO.   A4

MONITOR: AFOSR
           TR-90-0436

MONITOR: AFOSR
           TR-90-0428

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U)   The grant provided instrumentation which
has been included within our Laboratory for the advanced
Nuclear Magnetic Resonance study of polymers in the solid
state. The substantial majority of our initial, specific
NMR objectives have been accomplished. These include the
study of the structure and morphology of Poly(p-phenylene
vinylene) (PPV) and the Molecular Interactions in High
Temperature Polymer Blends. The instrumentation has
provided experimental capability in two new areas which
are being used generally in further work. In particular
we have 1) implemented methods for the NMR study of the
structure and orientation of high strength films and
fibers. These methods are now being used for the study of
PBZT fibers. 2) Two-dimensional NMR methods have been
developed which provides for quantitative measurement of
conformation and domain structure of blends. Two-
dimensional NMR will be a major thrust of future NMR
blends experiments. (AW)

ABSTRACT: (U)   In several experiments, observers were
given glimpses of 4-word arrays. Accuracy of word
location was tested after each array. Some words, called
familiar, appeared many times across the series of arrays;
others, called novel, appeared only once. The ratio of
novel to familiar words in an array ranged from 0:4 to 4:
0. When familiar and novel words were not intermixed (in
0:4 to 4:0 arrays), localization accuracy was higher for
familiar words. However, when they were intermixed,
especially in 1:3 arrays, accuracy tended to be higher
for the novel words. This novel popout effect was the
outcome of the suppressed localizability of the familiar
words (relative to the 0:4 baseline) and the enhanced
localizability of the novel words (relative to the 4:0
baseline). We attribute novel popout to the automatic
orientation of attention away from more fluently
unfolding regions of the perceptual field (familiar
objects) and toward less fluently unfolding regions
(novel objects). (sdw)

DESCRIPTORS: (U) *MEASUREMENT, *POLYMERS, *NUCLEAR
MAGNETIC RESONANCE, CONFORMITY, FILMS, HIGH STRENGTH,
HIGH TEMPERATURE, MIXTURES, MOLECULE MOLECULE
INTERACTIONS.

DESCRIPTORS: (U) *ATTENTION, *PERCEPTION(PSYCHOLOGY),
*STIMULI, *WORDS(LANGUAGE), ACCURACY, ARRAYS, AUTOMATIC,
ORIENTATION(DIRECTION), POSITION(LOCATION), RATIOS.

IDENTIFIERS: (U)   PE61104D, WUAFOSR3842A2.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2313A4.

AD-A221 401

AD-A221 394

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 390   7/3

AD-A221 390   CONTINUED

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

PHYSICAL CHEMISTRY, REACTION KINETICS, REACTIVITIES, REPRINTS, SURFACES, VARIATIONS.

(U) Laser Flash Photolytic Studies of Arylhalocarbenes,

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2.

90   15P

PERSONAL AUTHORS: Moss, Robert A.; Turro, Nicholas J.

CONTRACT NO.   AFOSR-90-0049

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0441

UNCLASSIFIED REPORT

ABSTRACT: (U)   The application of laser flash photolysis to the singlet arylhalocarbene-alkene addition reaction has already provided a rich harvest of basic information about this simplest of cycloaddition reactions. Problems encountered include the interpretation of various activation parameters, the interplay of enthalpy and entropy, the variation of reactivity and selectivity with structure, the possible existence of intermediates, and the applicability of Hammond postulate. It has not yet been possible to resolve all of these questions, and ambiguities may well be expected to remain when we deal with highly reactive intermediates that traverse relatively flat energy surfaces. Nevertheless, much has been learned, and the inevitable extension of the technique to the reactions of more stabilized singlet carbenes such as MeOCF and (MeO)2C promises to bridge remaining gaps between the physical organic chemistry of carbene reactions and that of more conventionally paced bimolecular reactions in solution. Keywords: Reaction kinetics; Reprints. (aw)

DESCRIPTORS: (U)   *CARBENES, *CYCLIC COMPOUNDS, ACTIVATION, ENERGY, ENTHALPY, ENTROPY, FLASHES, LASERS, MOLECULES, ORGANIC CHEMISTRY, PARAMETERS, PHOTOLYSIS.

AD-A221 390

AD-A221 390

AD-A221 387   12/9   23/3

NEUROGEN LABS INC BROOKLINE MA

(U) Adaptive Control of Visually Guided Grasping in Neural Networks.

DESCRIPTIVE NOTE: Final rept. 1 Jan-31 Dec 89,

MAR 90   25P

PERSONAL AUTHORS: Kuperstein, Michael

CONTRACT NO.   AFOSR-89-0030

PROJECT NO.   2313

TASK NO.   A8

MONITOR: AFOSR
TR-90-0420

UNCLASSIFIED REPORT

ABSTRACT: (U)   We present a theory and prototype of a neural controller called INFANT that learns sensory-motor coordination from its own experience. INFANT adapts to unforseen changes in the geometry of the physical motor system and to the location, orientation, shape and size of objects. It can learn to accurately grasp an enlongated object without any information about the geometry of the physical sensory-motor system. This new neural controller relies on the self-consistency between sensory and motor signals to achieve unsupervised learning. It is designed to be generalized for coordinating any number of sensory inputs with limbs of any number of joints. The simulation model was implemented with real targets and movements using two stereo TV cameras and a multijoint manipulator. The theory of sensory-motor coordination was extended from single movements to movement sequences. The neural network controller in the proposed study has a number of application benefits. The controller will deal effectively in novel working environments such as in space because of its ability to deal with unforeseen changes in the mechanical plant and actuators. Its adaptability will allow continuous self-calibration and its genetic design will allow it to be implemented in many different robots. The parallel feedforward control architecture will make robot control very fast and the

AD-A221 387

AD-A221 387   CONTINUED

overlapping modifiable neural weights will allow fault tolerance. This will greatly reduce tooling costs, setup time and failure in unforeseen environments. Keywords: Computerized simulation; Artificial intelligence. (aw)

DESCRIPTORS: (U)   *ADAPTIVE CONTROL SYSTEMS, *ARTIFICIAL INTELLIGENCE, *LEARNING, *ROBOTICS, ACTUATORS, ADAPTATION, BENEFITS, CALIBRATION, COMPUTERIZED SIMULATION, CONTROL, COSTS, ENVIRONMENTS, FAULTS, GENETICS, JOINTS, MODELS, MOTORS, NERVOUS SYSTEM, NEURAL NETS, PHYSICAL PROPERTIES, SELF OPERATION, SENSES(PHYSIOLOGY), SEQUENCES, SIGNALS, SIMULATION, STEREOSCOPIC CAMERAS, STEREOSCOPIC DISPLAY SYSTEMS, TARGETS, TELEVISION SYSTEMS, TOLERANCE, TOOLS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2313A8, *Neural Networks.

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 384   12/4

ILLINOIS UNIV AT URBANA COORDINATED SCIENCE LAB

(U) Stochastic Systems with Multiple Decision Makers and Parametric Uncertainties.

DESCRIPTIVE NOTE: Final technical rept. 1 May 88-31 Aug 89,

JAN 90   18P

PERSONAL AUTHORS: Basar, Tamer

CONTRACT NO.   AFOSR-88-0178

PROJECT NO.   2304

TASK NO.   A8

MONITOR: AFOSR
TR-90-0435

UNCLASSIFIED REPORT

ABSTRACT: (U)   This final report summarizes the findings of research on the topic Stochastic Dynamic Systems with Multiple Decision Makers and Parametric Uncertainties, supported by a Grant from the Air Force Office of Scientific Research, during the period May 1, 1988-August 31, 1989. The focus of the research during this 15-month period has been on the development of analytical and numerical solution techniques for stochastic control and team problems which involve active learning, the study of the impact of nonclassical information patterns in distributed decision making, and the development of real-time implementable distributed algorithms incorporating memory, for computation of equilibria in deterministic and stochastic games. Keywords: Team-optimal, Person-by-person optimal; Pareto optimal; Nash equilibrium; Stackelberg equilibrium. (kr)

DESCRIPTORS: (U)   *PARAMETERS, *DECISION MAKING, *STOCHASTIC PROCESSES, ALGORITHMS, DETERMINANTS(MATHEMATICS), DISTRIBUTION, DYNAMICS, IMPACT, LEARNING, NUMERICAL METHODS AND PROCEDURES, PATTERNS, REAL TIME, RECREATION, STOCHASTIC CONTROL, TEAMS(PERSONNEL).

IDENTIFIERS: (U)   WUAFOSR2304A8, PE61102F.

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AD-A221 378   19/6

POLYTECHNIC UNIV BROOKLYN NY DEPT OF ELECTRICAL ENGINEERING AND COMPUTER SCIE NCE

(U) Novel Schemes for Electromagnetic Launchers.

DESCRIPTIVE NOTE: Final rept. 1 Sep 86-30 Sep 87,

FEB 88   16P

PERSONAL AUTHORS: Zabar, Zivan

CONTRACT NO.   F49620-86-C-0126

PROJECT NO.   S812

TASK NO.   B1

MONITOR: AFOSR
TR-90-0519

UNCLASSIFIED REPORT

ABSTRACT: (U)   A design concept of the coil gun together with its power conditioning unit as an integrated system has been developed. The coil gun operates on the principle of the classical multiphase induction machine, and can therefore be called a linear induction launcher (LIL). It has the advantage of eliminating the need for accurate synchronization of the switching sequence. The projectile consists of a payload housed within a conductive sleeve. Strong centering forces due to the currents in the sleeve provide stability and minimize the magnetic fields within. The power conditioner functions efficiently by using the energy left over from the previous stages to provide energy for later higher-velocity stages. Linear induction launcher. Synchronization, Coil gun. (jes)

DESCRIPTORS: (U)   *LAUNCHERS, ACCURACY, COILS, CONDUCTIVITY, ELECTROMAGNETISM, FUNCTIONS, GUNS, INDUCTION SYSTEMS, INTEGRATED SYSTEMS, MAGNETIC FIELDS, POWER CONDITIONING, SEQUENCES, SLEEVES, SWITCHING, SYNCHRONIZATION(ELECTRONICS).

IDENTIFIERS: (U)   PE63220C, WUAFOSRS812B1.

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DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

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AD-A221 377   CONTINUED

VANDERBILT UNIV NASHVILLE TN DEPT OF CHEMISTRY

CHEMISTRY, QUANTUM STATISTICS, REPRINTS, STABILIZATION, ULTRAVIOLET RADIATION, VAPOR PHASES.

(U) Ab Initio Studies of Molecular Anions Stabilized in Point-Charge Lattices: Excited Electronic States of OH(-),

IDENTIFIERS: (U)   PE61102F, WUAFOSR3484A2.

JAN 90   8P

PERSONAL AUTHORS: Tellinghuisen, Joel; Ewig, Carl S.

CONTRACT NO.   F49620-86-C-0125

PROJECT NO.   3484

TASK NO.   A2

MONITOR: AFOSR
TR-90-0375

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters v165 n4 p355-361, 19 Jan 90.

ABSTRACT: (U)   In an attempt to better understand the ultraviolet absorption and emission spectra of hydroxide ion, we have carried out what we believe are the first ab initio quantum chemical calculations on excited electronic states of this ion. Because these excited states all lie well above the ionization potential of hydroxide ion in vacuo, they are expected to be unstable with respect to autodetachment. This means that in the gas phase they can probably be detected only as resonances in electron scattering processes. This instability will also be evident in beyond-Hartree-Fock quantum calculations on such states, because with sufficient flexibility in the basis, the energy will tend toward that of a lower state of the neutral molecule. To render the excited electronic states computationally stable, we have surrounded the hydroxide ion by a simple point-charge lattice representative of the actual alkali halide lattices. Keywords: Ab initio theory, Diatomic anions, Impurity centers, Alkali, Halides, Reprints. (jg)

DESCRIPTORS: (U)   *ANIONS, *DIATOMIC MOLECULES, *HYDROXIDES, *IONS, *MOLECULES, ABSORPTION, ELFCTRON SCATTERING, ELECTRONIC STATES, EMISSION SPECTRA, HALIDES, IMPURITIES, IONIZATION POTENTIALS, NEUTRAL, QUANTUM

AD-A221 377

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AD-A221 375   13/11

STATE UNIV OF NEW YORK AT ALBANY RESEARCH FOUNDATION

(U) Control Structure Interaction Instrumentation.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov
89,

MAR 90   9P

PERSONAL AUTHORS: Inman, Daniel J.

CONTRACT NO.   AFOSR-89-0143

PROJECT NO.   3842

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0450

UNCLASSIFIED REPORT

ABSTRACT: (U)   This instrumentation award funded the
purchase of a strain gauge instrumentation system,
piezoelectric actuator system, a pneumatic thruster
control system and a digital AD/DA controller system
(Systolic System, Inc., Optima 3 nonlinear robotics
controller) for use in experiments in identification and
control of flexible structures modeled by partial
differential equations. This equipment, combined with
existing vibration suppression, slewing control and
testing facilities provides a unique identification and
control facility for flexible structures. The
piezoelectric devices combined with existing electric
motors, proof mass actuators and accelerometers provide
an excellent facility for examining the theory related to
active structures. In particular, experiments have been
design and initial testing begun on vibration suppression
during slewing control of an active truss. (jes)

DESCRIPTORS: (U)   *CONTROL SYSTEMS, *PNEUMATIC EQUIPMENT.
ACCELEROMETERS, ACTUATORS, CONTROL, CONTROL CENTERS,
ELECTRIC MOTORS, FLEXIBLE STRUCTURES, INSTRUMENTATION.
INTERACTIONS, MASS, PARTIAL DIFFERENTIAL EQUATIONS.
PIEZOELECTRIC MATERIALS, SLEWING, STRAIN GAGES.
STRUCTURES, SUPPRESSION, THRUSTERS, TRUSSES, VIBRATION.

IDENTIFIERS: (U)   PE61104D, WUAFOSR3842A1.

AD-A221 375

AD-A221 376   15/5

ILLINOIS INST OF TECH CHICAGO

(U) Acquisition of an Analytical X-ray and Image Analysis
System.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov
89,

APR 90   6P

PERSONAL AUTHORS: Nash, Philip

CONTRACT NO.   AFOSR-89-0116

PROJECT NO.   3842

TASK NO.   A3

MONITOR: AFOSR
            TR-90-0424

UNCLASSIFIED REPORT

ABSTRACT: (U)   The List of equipment purchased is as
follows: 1) Princeton Gamma-Tech IMIX-IV system, 2)
Camera/monitor package, 3) Remote workstation, 4) PC with
optical disk drive and printer, 5) Ethernet interface for
PC, 6) Stage motorization package, 7) Peak Wavelength
spectrometer. Approximately 20 graduate students and
several faculty from four different departments on campus
have made use of the new equipment, with about 8 people
using the equipment on a weekly basis. The equipment is
operated on two 8 hour shifts Monday through Friday
occasional used on weekends. Computer hardware; Optics;
Logistics; X-ray spectroscopy; Image processing;
Government procurement; Air Force equipment. (jg)

DESCRIPTORS: (U)   *ACQUISITION, *IMAGE PROCESSING, *X
RAYS, AIR FORCE EQUIPMENT, CAMERAS, COMPUTERS, DISKS,
DRIVES, FREQUENCY, GOVERNMENT PROCUREMENT, LOGISTICS,
MONITORS, OPTICAL STORAGE, OPTICS, PEAK VALUES, PRINTING
EQUIPMENT, SPECTROMETERS, X RAY SPECTROSCOPY.

IDENTIFIERS: (U)   WUAFOSR3842A3.

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DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 373   7/4   20/3

AD-A221 373   CONTINUED

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) Low-Energy Electron Diffraction and Voltammetry of
Carbon Monoxide Electrosorbed on Pt(111).

results, the organizational information obtained from
LEED (low energy electron diffraction) measurements, and
structures proposed by gas-phase researchers, the two
current peaks have been assigned to CO adsorbed in c(4 x
2) domains and in high-density fault lines bordering
these domains. Physical chemistry; Electrical measurement;
Adsorption; Electrosorbed; Reprints; Gas-phase surface
science; Liquid phases. (jg)

DESCRIPTIVE NOTE: Rept. for May 88-Apr 90,

90   8P

DESCRIPTORS: (U)   *ADSORPTION, *ELECTRON DIFFRACTION,
*LOW ENERGY, *VOLTAMMETRY, *PLATINUM, CARBON MONOXIDE,
ELECTRICAL MEASUREMENT, ELECTROCHEMISTRY, ENVIRONMENTS,
FAULTS(GEOLOGY), HIGH DENSITY, LIQUID PHASES,
ORGANIZATIONS, PACKING DENSITY, PHYSICAL CHEMISTRY,
REPRINTS, ROOM TEMPERATURE, SATURATION, STRUCTURES,
ULTRAHIGH VACUUM, VACUUM.

PERSONAL AUTHORS: Zurawski, D.; Wasberg, M.; Wieckowski,
A.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A1.

CONTRACT NO.   AFOSR-89-0368

PROJECT NO.   2303

TASK NO.   A1

MONITOR: AFOSR
TR-90-0442

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in The Jnl. of Physical
Chemistry, v94 n5 p2076-2082 1990.

ABSTRACT: (U)   The organization of carbon monoxide
electrosorbed at various coverages on a Platinum III
single-crystal electrode has been studied by using ex
situ characterization by low-energy electron diffraction.
Two carbon monoxide structures have been identified for
saturation and partial coverage, respectively. A third
structure was observed after prolonged exposure of a
saturation coverage of CO to the ultrahigh vacuum
environment. The packing density of electrosorbed CO
attained at saturation coverage is higher than that
observed in gas-phase research for CO adsorbed at room
temperature; however, it is comparable with the maximum
coverage attained for low-temperature gas-phase
adsorption. The appearance of the structure at all
partial coverages of electrosorbed CO has been
interpreted as being indicative of the formation of
islands of this high-coverage structure in the
electrochemical environment. Current-potential profiles
obtained for partial coverages exhibit two
distinguishable peaks which have been attributed to the
oxidation of CO adsorbed in different sites within the
the adlattice. Through a correlation of the voltammetric

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AD-A221 372   7/2   20/8

COLORADO UNIV AT BOULDER DEPT OF CHEMISTRY AND
BIOCHEMISTRY

(U) Observation of the NF2+ Dication in the Electron
     Impact Ionization Mass Spectrum of NF(3),

FEB 90   5P

PERSONAL AUTHORS: Rogers, Steven A.; Miller, Paul J.;
Leone, Stephen R.; Brehm, Burkhard

CONTRACT NO.   AFOSR-89-0074

PROJECT NO.   2303

TASK NO.   B1

MONITOR: AFOSR
            TR-90-0457

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,
     v168 n2 p137-140, 16 Feb 90.

ABSTRACT: (U)   The Nitrogen difluoride (NF2(+)) dication
has been experimentally observed for the first time by
electron impact ionization of Nitrogen trifluoride
followed by mass analysis of the ionization products. The
direct detection of NF2(+) by mass spectrometry indicates
that the dication species is kinetically stable, in
agreement with recent ab initio molecular orbital
calculations. A lower limit for the NF2(+) lifetime is
obtained (> or = 10 microsec) along with its appearance
energy (43.8 + or - 1.0 electron Volts) in the electron
impact ionization of NF3. Appearance potential, Dication,
Electron ionization, NF(++), Reprints, Barrier to
dissociation, Deep potential well. Reprints. (jg)

DESCRIPTORS: (U)   *FLUORIDES, *NITROGEN, *CATIONS,
BARRIERS, COMPUTATIONS, DETECTION, DISSOCIATION, ELECTRON
IMPACT SPECTRA, ELECTRONS, IONIZATION, MASS, MASS
SPECTROMETRY, MOLECULAR ORBITALS, NITROGEN COMPOUNDS,
REPRINTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B1.

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AD-A221 371   9/3

ILLINOIS UNIV AT URBANA DEPT OF MECHANICAL AND INDUSTRIAL
ENGINEERING

(U) Research Equipment Purchased Under Grant AFOSR-86-0257.

DESCRIPTIVE NOTE: Final technical rept. Jan 86-May 89,

MAY 89   46P

PERSONAL AUTHORS: Krier, Herman

CONTRACT NO.   AFOSR-86-0257

PROJECT NO.   2308

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0449

UNCLASSIFIED REPORT

ABSTRACT: (U)   Through AFOSR, as part of the University
Research Instrumentation Program, the Department
Mechanical and Industrial Engineering of the University
of Illinois was awarded the funds to purchase equipment
in support of research dealing with high temperature
thermodynamics, plasma formation, and laser-gas
interaction. AFOSR has been supporting research under a
separate grant, a program dealing with Beamed Energy
(Laser) Rocket Propulsion. This report summarizes
research instrumentation purchased on this grant program.
Information Digital Imaging and Laser Induced
Fluorescence is given. The equipment includes: Excimer
Laser; Dye Laser; Imaging Optics and support equipment.
The report also summarizes research capabilities now
possible in non-equilibrium laser-sustained plasmas. (jes)

DESCRIPTORS: (U)   *DYE LASERS, DIGITAL SYSTEMS, EXCIMERS,
HIGH TEMPERATURE, IMAGES, INDUSTRIAL ENGINEERING,
INSTRUMENTATION, LASER INDUCED FLUORESCENCE, LASERS,
MECHANICAL ENGINEERING, MONEY, OPTICS, PLASMAS(PHYSICS),
PROCUREMENT, ROCKET PROPULSION, THERMODYNAMICS,
UNIVERSITIES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A1.

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AD-A221 370   12/4

AD-A221 352   7/3

RUTGERS - THE STATE UNIV NEW BRUNSWICK NJ

GORDON RESEARCH CONFERENCES INC KINGSTON RI

(U) Analysis and Regulation of Nonlinear Systems.

(U) Gordon Research Conference on Organometallic Chemistry. Held in Newport, Rhode Island on 27 June - 1 July 1988.

DESCRIPTIVE NOTE: Interim technical rept. 1 Aug 88-31 Jul 89,

DESCRIPTIVE NOTE: Final rept.,

AUG 89   6P

JUL 88   9P

PERSONAL AUTHORS: Sontag, Eduardo D.

PERSONAL AUTHORS: Eisenberg, Richard

CONTRACT NO.   AFOSR-88-0235

CONTRACT NO.   AFOSR-88-0193

PROJECT NO.   2304

PROJECT NO.   2303

TASK NO.   A1

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0433

MONITOR: AFOSR
            TR-90-0473

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report describes work during this period in the following categories: 1) Nonlinear Feedback; 2) Computational Complexity in Control; 3) Nonlinear Realization; 4) Neural Nets; 5) Other Topics.

ABSTRACT: (U)   A Gordon Research Conference on the Organometallic Chemistry was held at the Salve Regina College 27 June - 1 July 1988. A broad range of topics were covered: polymerization catalysis, odd-electron organometallics/para hydrogen polarization, application to organic synthesis, reactions and mechanisms, new materials, new techniques, atom transfer reactions, redox and photochemistry, and polynuclear systems. Organic chemistry, Symposia, Quantum dots, FTIR methods, Asymmetric hydrogenation catalysis, Olefin polymerization. (jg)

DESCRIPTORS: (U)   *CONTROL THEORY, *NEURAL NETS, COMPUTATIONS, FEEDBACK, NONLINEAR SYSTEMS.

DESCRIPTORS: (U)   *CHEMISTRY, *ORGANOMETALLIC COMPOUNDS, ASYMMETRY, ATOMS, CATALYSIS, HYDROGENATION, OLEFIN POLYMERS, ORGANIC CHEMISTRY, ORGANIC MATERIALS, PHOTOCHEMICAL REACTIONS, POLYMERIZATION, SYMPOSIA, SYNTHESIS, TRANSFER.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A1.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2.

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AD-A221 348   18/4   7/8

TEXAS A AND M UNIV COLLEGE STATION DEPT OF CHEMISTRY

(U) DURIP Electrochemistry-Surface Spectroscopy Instrument.

DESCRIPTIVE NOTE: Final rept.,

APR 90   13P

PERSONAL AUTHORS: Martin, Charles R.; Soriaga, Manuel P.

CONTRACT NO.   AFOSR-89-0202

PROJECT NO.   3842

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0437

UNCLASSIFIED REPORT

ABSTRACT: (U)   This is the final report for the DURIP
grant 'DURIP Electrochemistry-Surface Spectroscopy
Instrument'. The funds obtained via DURIP grant were used
to purchase a research-quality Fourier-transforms
infrared spectrometer. This FTIR was used to investigate
preferential orientation of polymer chains within
ultranarrow electronically conductive polymer fibers.
This investigations have shown that the polymer chains
are preferentially oriented parallel to the fiber axis.
This helps explain the enhanced electronic conductivities
observed in some of these ultranarrow conductive polymer
fibers. Fourier-transforms infrared spectrometer (FTIR),
Polymer chains, Electronically conductive polymer fibers,
Nuclear instrumentation, Atomic and molecular physics.
(jg)

DESCRIPTORS: (U)   *FIBERS, *NUCLEAR INSTRUMENTATION,
*POLYMERS, CHAINS, CONDUCTIVITY, ELECTRONICS, MOLECULAR
STRUCTURE, NUCLEAR PHYSICS, ORIENTATION(DIRECTION).

IDENTIFIERS: (U)   PE61104D, WUAFOSR3842A2.

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AD-A221 347   9/1   11/6

ILLINOIS UNIV AT URBANA DEPT OF CHEMISTRY

(U) Comparison of Voltammetry of Vacuum-Prepared Rh(100)
and Rh(111) Electrodes.

DESCRIPTIVE NOTE: Rept. for May 88-Apr 90.

90   9P

PERSONAL AUTHORS: Wasberg, M.; Hourani, M.; Wieckowski, A.

CONTRACT NO.   AFOSR-89-0368

PROJECT NO.   2303

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0439

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanalytic
Chemistry, v278 p425-432 1990.

Reprint: Comparison of Voltammetry of Vacuum-Prepared
Rh(100) and Rh(111) Electrodes.

DESCRIPTORS: (U)   *ELECTRODES, *VOLTAMMETRY, COMPARISON.
RHODIUM, RHENIUM, REPRINTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A1.

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DTIC REPORT BIBLIOGRAPHY

AD-A221 328   6/1   6/4

NEW YORK ACADEMY OF SCIENCES NY

(U) *Arachidonic Acid Metabolism in the Nervous System.*
Physiological and Pathological Significance: Annals of
the New York Academy of Sciences. Volume 559.

DESCRIPTIVE NOTE: Final rept. 1 Apr 88-31 Mar 89,

APR 90   517P

PERSONAL AUTHORS: Barkai, Amiram I.; Bazan, Nicholas G.

CONTRACT NO.   AFOSR-88-0138

PROJECT NO.   2313

TASK NO.   A2

MONITOR: AFOSR
           TR-90-0488

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Availability: The New York Academy of
Sciences, 2 East 63rd St. New York, NY 10021. PC & HC
$125.00. No copies furnished by DTIC/NTIS.

ABSTRACT: (U)   An international conference on Arachidonic
Acid Metabolism in the Nervous System was held in
Bethesda, Maryland, 14-17 April 1988. The conference,
organized by the New York Academy of Sciences, provided a
forum for review and discussion of recent developments in
research on arachidonic acid and its metabolites,
including prostaglandins, thromboxanes and leukotrienes in
relation to their function in the nervous system. The
papers presented at the conference were published as
Volume 559 of the Annals of the New York Academy of
Sciences. Biochemistry, Fatty acids, Diacylglycerol
lipases, Phospholipids, Lipoxygenase products,
Eicosanoids, Brain microvessels, Choroid plexus,
Guanosine triphosphate (GTP) Binding protein, Cyclic AMP
(adenosine 3'5'-cyclic phosphate), Vasogenic brain edema,
Astrocytic swelling, Ischemic neuronal damage, Convulsive
disorders, Normal and abnormal brain functions, Symposia.

DESCRIPTORS: (U)   *FATTY ACIDS, *LIPID METABOLISM,
*NERVOUS SYSTEM, *METABOLITES, PROSTAGLANDIN,
PHOSPHOLIPIDS, PROTEINS, ADENOSINE PHOSPHATES, NERVOUS

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SYSTEM DISEASES, PHYSIOLOGY, SYMPOSIA, BRAIN.

IDENTIFIERS: (U)   Lipases, Guanosine triphosphate,
Adenosine monophosphate, Thromboxanes, Leukotrienes.

AD-A221 322   23/4   9/3   AD-A221 322   CONTINUED

                                        Wire guided missiles), M-47 gunners.

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF MATERIALS SCIENCE

(U) The Effects of Protective Eyewear on TOW Field of View.

DESCRIPTIVE NOTE: Final rept. 1 Jan 87-31 Dec 89,

MAR 90   150P

PERSONAL AUTHORS: Wert, J. A.; Starke, E. A.

REPORT NO.   UVA/525672/MS90/101

CONTRACT NO.   AFOSR-87-0082

PROJECT NO.   2306

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0383

           UNCLASSIFIED REPORT

ABSTRACT: (U)   This research has been concerned with the
use of processing to optimize the microstructure of
advanced aluminum alloys for property improvement. The
report was concerned with microstructure control and
fracture. The focus was on the effect of shearable and
non-shearable precipitates on slip behavior, void
nucleation and fracture; the effect of composition on
quench sensitivity and fracture; the effect of
nonequilibrium eutectic melting during solution heat
treatment on intergranular fracture; and the effect of
slip behavior on fatigue crack propagation. Task II is
covered in Part II of this report and was concerned with
processing of advanced aluminum alloys for microstructure
control for improvement of superplastic forming
properties. The detailed studies of this task have
allowed identification of the material and processing
parameters that control development of the
microstructural features required for superplasticity.
Keywords: Particle size.

DESCRIPTORS: (U)   *PROTECTIVE EQUIPMENT, *LASER SAFETY,
*EYEGLASSES, EYE, GUNNERS, GUIDED MISSILES, WIRE GUIDANCE,
DEGRADATION, IMPACT, OBSERVERS, TRACKING.

IDENTIFIERS: (U)   TOW(Tube launched Optically tracked

AD-A221 322

AD-A221 306   7/2   7/3

CALIFORNIA INST OF TECH PASADENA ARTHUR AMOS NOYES LAB
OF CHEMICAL PHYSICS

(U) Femtosecond Transition-State Spectroscopy of Iodine:
     From Strongly Bound to Repulsive Surface Dynamics,

SEP 89   8P

PERSONAL AUTHORS: Bowman, R. M.; Dantus, M.; Zewail, A. H.

CONTRACT NO.   AFOSR-90-0014

PROJECT NO.   2303

TASK NO.   B1

MONITOR: AFOSR
           TR-90-0379

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters,
v161 n4,5 p297-302, 22 Sep 89.

ABSTRACT: (U)   The application of femtosecond transition-
state spectroscopy (FTS) to molecular iodine is reported.
The real-time motion of wave packets prepared coherently
in the bound B state is observed. In addition, the motion
is probed near and above the dissociation limit for the
reaction: I2 yields I(2P3/2)+I*(2P1/2). FTS measurements
of the dynamics on repulsive surfaces are also reported.
Femtosecond, Transition-state, Spectroscopy, Molecular
iodine, Real-time, Halogens, Wave packets. (eg)

DESCRIPTORS: (U)   *IODINE, *SPECTROSCOPY, *TRANSITIONS,
DISSOCIATION, DYNAMICS, HALOGENS, LIMITATIONS, MOLECULES,
MOTION, REAL TIME, SURFACES, WAVE PACKETS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B1.

AD-A221 306

AD-A221 303   7/4

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) Proceedings of the Topical Meeting on the Microphysics
     of Surfaces, Beams, and Adsorbates (3rd) Held in Salt
     Lake City, Utah on 27 February-1 March 1989,

89   172P

PERSONAL AUTHORS: Chuang, T. J.; Rhodin, T. N.

CONTRACT NO.   AFOSR-89-0266

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0521

UNCLASSIFIED REPORT

Availability: Optical Society of America, 1818 Jefferson
Place, NW., Washington, DC 20036. HC $62.00. No copies
furnished by DTIC/NTIS.

ABSTRACT: (U)   Contents: Surface photoprocesses in laser-
assisted etching and film growth; In situ ellipsometry of
thin-film deposition: Implications for amorphous and
microcrystalline Si growth; Adsorption of NO on diamond
C(111)-(2X1) by band-gap excitation; Thermal and
photostimulated reactions on Si2H6-adsorbed Si(100)2X1
surfaces: Mechanisms of Si film growth by atomic-layer
epitaxy; Comparison of disilane and hydrogen adsorption
on Si(111)-7X7; Electron beam induced selective etching
and deposition technology; Selected area epitaxy in II-VI
compounds by laser-induced photo-metalorganic vapor phase
epitaxy; Ultraviolet laser excited adsorbate-surface
interactions: NH3, C2H4, and CH2I2 on Al and oxidized Al
surfaces; Optical second harmonic generation from Ni(110)
with adsorbed CO; Polarized adsorption of H2O on NaCl(100)
in air, observed by second harmonic generation; Adsorbate-
induced surface states and Fermi-level pinning at
semiconductor surfaces; Band bending and oxygen-induced
defects in a-Si:H; Bonding of As and Se to silicon
surfaces; Surface modification by plasmas: X-ray
photoemission studies; Investigations of the altered
surface formed during the ion-assisted etching of
titanium; Structure and dynamics of strong chemisorption

AD-A221 303

AD-A221 303   CONTINUED

AD-A221 296   9/5   20/6

STATE UNIV OF NEW YORK AT BUFFALO AMHERST

(U) Dynamics of Third-Order Nonlinear Optical Processes in
     Langmuir-Blodgett and Evaporated Films of
     Phthalocyanines,

on Si(111) as measured with atomic helium scattering;
Characterization of single step-edge defects using He
atom scattering; Electron, ion and photon beam induced
reduction of SnO2(110): Power dissipation thresholds.
Symposia. (Jhd)

FEB 90   8P

PERSONAL AUTHORS: Casstevens, Martin K.; Samoc, Marek;
          Pfleger, Jiri; Prasad, Paras N.

DESCRIPTORS: (U) *ADSORBATES, *SEMICONDUCTORS, *SURFACE
PROPERTIES, ADSORPTION, AMORPHOUS MATERIALS, ATOMS,
COMPARISON, CRYSTALLIZATION, DEPOSITION, DYNAMICS,
ELECTRONS, ELLIPSOMETERS, ENERGY BANDS, ENERGY GAPS,
EPITAXIAL GROWTH, ETCHING, EXCITATION, GROUP II-VI
COMPOUNDS, GROWTH(GENERAL), HARMONIC GENERATORS, INDUCED
ENVIRONMENTS, IONS, MICROSTRUCTURE, MODIFICATION, OPTICAL
PROPERTIES, PHOTOELECTRIC EMISSION, PHOTON BEAMS, PHYSICS,
PLASMAS(PHYSICS), POLARIZATION, REDUCTION, SCATTERING,
SILANES, SILICON, SYMPOSIA, THIN FILMS, TITANIUM, X RAYS.

CONTRACT NO.   F49620-87-C-0042

PROJECT NO.   2303

TASK NO.   A3

MONITOR: AFOSR
            TR-90-0408

IDENTIFIERS: (U) Tin Oxides, WUAFOSR2301A1, PE61102F.

UNCLASSIFIED REPORT

ABSTRACT: (U)   The results of degenerate four-wave mixing
studies performed on evaporated films of metal-free
phthalocyanine and Langmuir-Blodgett films of a silicon
phthalocyanine using subpicosecond 602nm pulses are
reported. The third-order nonlinearity of all the samples
is high permitting the observation of the degenerate four-
wave mixing signal from even a monolayer. In both cases,
the third-order nonlinearity has a resonant character and
the observed time-resolved phase conjugate signals
provide information on the dynamics of excitons.
Simultaneously monitoring first- and second-order
diffractions from the transient gratings formed in our
samples allowed us to obtain more-detailed information on
the factors influencing the temporal behavior of the
nonlinear response. It is concluded that the dynamics of
excitons determining the nonlinearity is mainly governed
by the presence of bimolecular exciton-exciton
interaction. Saturation behavior is observed at high
light intensities. Reprints. (jhd)

DESCRIPTORS: (U) *EXCITONS, *NONLINEAR SYSTEMS, *OPTICAL
PROCESSING, *PHTHALOCYANINES, BEHAVIOR, DYNAMICS,
GRATINGS(SPECTRA), HIGH RATE, INTENSITY, LIGHT, REPRINTS.

AD-A221 296

AD-A221 303

DTIC REPORT BIBLIOGRAPHY

AD-A221 298   CONTINUED

RESONANCE, RESPONSE, SATURATION, SIGNALS, SILICON, TIME, TRANSIENTS.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303A3, Langmuir Blodgett Films, Four Wave Mixing.

AD-A221 292   11/6.1

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF MATERIALS SCIENCE

(U) Processing and Properties of Advanced Aluminum Alloys.

DESCRIPTIVE NOTE: Final rept. 1 Jan 87-31 Dec 89,

MAR 90   150P

PERSONAL AUTHORS: Wert, J. A.; Starke, E. A.

REPORT NO.   UVA/525672/MS90/101

CONTRACT NO.   AFOSR-87-0082

PROJECT NO.   2306

TASK NO.   A2

MONITOR: AFOSR
TR-90-0383

UNCLASSIFIED REPORT

ABSTRACT: (U)   This research has been concerned with the use of processing to optimize the microstructure of advanced aluminum alloys for property improvement. The report was concerned with microstructure control and fracture. The focus was on the effect of shearable and non-shearable precipitates on slip behavior, void nucleation and fracture; the effect of composition on quench sensitivity and fracture; the effect of nonequilibrium eutectic melting during solution heat treatment on intergranular fracture; and the effect of slip behavior on fatigue crack propagation. Task II is covered in Part II of this report and was concerned with processing of advanced aluminum alloys for microstructure control for improvement of superplastic forming properties. The detailed studies of this task have allowed identification of the material and processing parameters that control development of the microstructural features required for superplasticity. Keywords: Particle size. (kr)

DESCRIPTORS: (U) *ALUMINUM ALLOYS, *MICROSTRUCTURE, CONTROL, CRACK PROPAGATION, EUTECTICS, FATIGUE(MECHANICS), IDENTIFICATION, MATERIALS, MELTING, NONEQUILIBRIUM FLOW, NUCLEATION, PARAMETERS, PARTICLE SIZE, PLASTIC PROPERTIES, PROCESSING, SOLUTION HEAT TREATMENT, SUPERPLASTICITY,

AD-A221 292

AD-A221 298

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 277   7/6   20/6

STATE UNIV OF NEW YORK AT BUFFALO AMHERST

(U) Resonant Third-Order Nonlinear Optical Properties of
Poly(3-Dodecylthiophene).

MAR 90   7P

PERSONAL AUTHORS: Singh, Bhanu P.; Samoc, Marek; Nalwa,
Hari S.; Prasad, Paras N.

CONTRACT NO.   F49620-87-C-0042

PROJECT NO   2303

TASK NO.   A3

MONITOR: AFOSR
TR-90-0507

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v92
n5 p2756-2761, 1 Mar 90.

ABSTRACT: (U)   We have investigated the resonant
nonlinear optical properties of both chemically prepared
and electrochemically prepared poly (3-dodecylthiophene)
samples using femtosecond degenerate four-wave mixing.
The measured X(3) values for the two polymers are 3 x 10
to the -10 power and 5 x 10 to the -10 power esu at 602
nm. The value of X(3) at 705 nm is an order of magnitude
less. The nonlinearity shows a subpicosecond response.
The power dependence of the conjugate reflectivity shows
saturation at high input powers. The origin of this
saturation is discussed in terms of the saturable
absorber behavior. It is concluded that the saturation is
consistent with the predictions of simple kinetic models.
The origin of the phase conjugate response is discussed
in terms of two models: (i) phase space filling model
involving unrelaxed excitons and (ii) rapid
conformational deformation leading to shift of oscillator
strength to photogenerated polaronic states. The analysis
of our results favors the mechanisms involving unrelaxed
excitons as the source of the observed third-order
optical nonlinearity. Reprints. (kt)

DESCRIPTORS: (U) *NONLINEAR SYSTEMS, *OPTICAL PROPERTIES,
DEFORMATION, EXCITONS, HIGH POWER, INPUT, KINETICS.

AD-A221 277

AD-A221 292   CONTINUED

VOIDS.

IDENTIFIERS: (U)   WUAFOSR2306A2.

AD-A221 292

AD-A221 277   CONTINUED

MODELS, OSCILLATORS, POLYMERS, POWER, REFLECTIVITY,
REPRINTS, RESONANCE, RESPONSE, STRENGTH(GENERAL).

IDENTIFIERS: (U)   WUAFOSR2303A3, PE61102F,
    Dodecylthiophenes, Thiophenes.

AD-A221 276   7/4   20/13   7/5

SYSTEMS RESEARCH LABS INC DAYTON OH

(U) Surface Thermometry by Laser-Induced Fluorescence.

    DEC 89   6P

PERSONAL AUTHORS: Goss, L. P.; Smith, A. A.; Post, M. E.

CONTRACT NO.   F49620-87-C-0040

PROJECT NO.   2308

TASK NO.   A3

MONITOR: AFOSR
    TR-90-0516

            UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Review of Scientific
    Instruments, v60 n12 p3702-3706 Dec 89.

ABSTRACT: (U)   A novel laser-induced fluorescence
technique has been developed for measuring the surface
temperature of reacting and nonreacting materials. The
technique involves seeding the material to be examined
with a temperature-sensitive phosphor (Dysprosium:Yttrium
Aluminum Garnet) and monitoring the laser-induced
fluorescence of the phosphor to determine the temperature.
The Dy:YAG phosphor displays a temperature sensitivity in
the range 300-1700 K. The technique has been applied to
both reacting and nonreacting surfaces under laser
excitation, allowing temperature and temporal-history
profiles to be determined. Keywords: Rare-earth ions;
Reprints. (kt)

DESCRIPTORS: (U)   *LASER INDUCED FLUORESCENCE,
*TEMPERATURE MEASURING INSTRUMENTS, *SURFACE TEMPERATURE,
DISPLAY SYSTEMS, DYSPROSIUM, EXCITATION, IONS, LASERS,
PHOSPHORS, RARE EARTH ELEMENTS, REPRINTS, SENSITIVITY,
TEMPERATURE, TEMPERATURE SENSITIVE ELEMENTS, YTTRIUM
ALUMINUM GARNET.

IDENTIFIERS: (U)   WUAFOSR2308A3, PE61102F, *Thermometry.

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D**C REPORT BIBLIOGRAPHY

AD-A221 275   7/3

AD-A221 275   CONTINUED

NORTH TEXAS STATE UNIV   DENTON DEPT OF CHEMISTRY

IDENTIFIERS: (U)   WUAFOSR2303B2, PE61102F, Polycyclic
Ketones, Boron Trifluoride Etherate, Pentacyclododecanes,
Pentacyclotridecanes, Ethyl Diazoacetate.

(U) Tieffeneau-Demjanov Ring Homologations of Two
Pentacyclo(5.4.0.0(2,6).0(3,10).0(5,9))undecane-8,11-
diones,

89   6P

PERSONAL AUTHORS: Marchand, Alan P.; Rajapaksa, D.; Reddy,
S. P.; Watson, William H.; Nagl, Ante

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0499

UNCLASSIFIED REPORT

ABSTRACT: (U)   Ring expansions of substituted polycyclic
ketones provide a convenient and versatile method for the
construction of novel polycyclic 'cage' systems. Recently,
we have reported some examples of boron trifluoride
promoted ring homologations of substituted pentacyclo-(5.
4.0.0(2,6).0(3,10).0(5,9))undecane-8,11-diones (PCUD-8,11-
diones) with ethyl diazoacetate (EDA). The substituted
pentacyclododecanes and pentacyclotridecanes thereby
obtained have been employed as intermediates in the
synthesis of a new class of molecular clefts. By way of
contrast, reaction of 1,9-dihalo-PCUD-8,11-diones with
ethyl diazoacetate in the presence of boron trifluoride
etherate (F3B.OEt2) resulted in ring expansion with
concomitant rearrangement to afford substituted
dihydrocyclopent(a)indenes. The present study was
undertaken in an effort to delineate and to extend the
scope of ketone homologations of appropriately
substituted PCUDs. Reprints. (KT)

DESCRIPTORS: (U)   *KETONES, *CYCLIC COMPOUNDS, BORON
COMPOUNDS, ETHERS, EXPANSION, FLUORIDES, REPRINTS, RINGS,
SYNTHESIS(CHEMISTRY).

AD-A221 275

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DTIC REPORT BIBLIOGRAPHY

AD-A221 274   7/3

NORTH TEXAS STATE UNIV   DENTON DEPT OF CHEMISTRY

(U) Formation of Diastereoisomeric Pinacols via Reductive
     Coupling of D(3)-Trishomocubanone.

     90   5P

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante;
     Marchand, Alan P.; Reddy, G. M.

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
                TR-90-0496

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, vC46
p253-256 1990.

ABSTRACT: (U)   The X-ray crystal structure of
spiro[pentacyclo(7.3.0.0(4,8).0(5,12).0(7,11)) dodecan-2-
one-3,11'-pentacyclo(6.3.0.0(2,6).0(3,10).0(5,9)undecane)
, C22H24), is reported. Compound (4b) consists of two
spiro-fused cage systems. One cage is composed of three
fused norbornane (bicyclo(2.2.1)heptane) moieties, while
the other contain two norbornane and one bicyclo(2.2.2)
octanone moiety. The ideal envelope conformations of the
five-membered rings comprising the norbornane moieties
are significantly twisted by the ring fusions with the
normal 0 deg torsion angles form 16.6(2) to 28.5(2). The
bicyclooctane system also exhibits large twist
distortions. Keywords; Cage ketones, Ketones, Reprints.
(KT)

DESCRIPTORS: (U) *CRYSTAL STRUCTURE, *CYCLIC COMPOUNDS,
*HEPTANES, DISTORTION, ENVELOPE(SPACE), KETONES, REPRINTS,
RINGS, TWIST(MOTION), X RAYS.

IDENTIFIERS: (U)   WUAFOSR2303B2, PE61102F, Norbonane
Moieties, Undecanes, Dodecanes.

AD-A221 274

AD-A221 262   9/3

OPTICAL SOCIETY OF AMERICA WASHINGTON DC

(U) High Energy Density Physics with Subpicosecond Laser
     Pulses. 1989 Technical Digest Series Volume 17.

DESCRIPTIVE NOTE: Final rept. 1 Feb 89-31 Jan 90.

JAN 90   120P

CONTRACT NO.   AFOSR-89-0266

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
                TR-90-0412

UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson
Place, N.W., Washington, DC 20036. PC$62.00. No copies
furnished by DTIC/NTIS.

SUPPLEMENTARY NOTE: Summaries of papers presented at the
High Energy Density Physics with Subpicosecond Laser
Pulses Topical Meeting, Snowbird, Utah, September 11-13.
1989.

Reprint: High Energy Density Physics with Subpicosecond
Laser Pulses. 1989 Technical Digest Series Volume 17.

DESCRIPTORS: (U) *PULSED LASERS, *LASER TARGET
INTERACTIONS, LIGHT PULSES, SHORT PULSES, ELECTRONIC
STATES, SYMPOSIA, REPRINTS.

IDENTIFIERS: (U)   Subpicosecond Time, Energy Density,
Casimir Effect, PE61102F, WUAFOSR2301A1.

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DTIC REPORT BIBLIOGRAPHY

AD-A221 253   12/3

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

(U) A White Noise Theory of Infinite Dimensional Calculus.

DESCRIPTIVE NOTE: Technical rept.,

OCT 89   31P

PERSONAL AUTHORS: Hida, Takeyuki

REPORT NO.   TR-275

CONTRACT NO.   F49620-85-C-0144

PROJECT NO.   2304

TASK NO.   A5

MONITOR: AFOSR
            TR-90-0398

UNCLASSIFIED REPORT

ABSTRACT: (U)   Sections 1-4 are based on those three lectures with somewhat more attention devoted to the space of generalized white noise functionals. What is described here are mostly survey articles, though some state-of-the-art results are added, while Section 5 involves a new approach to the study of Gaussian random fields. This topic is exactly what the author wished to propose at the colloquium. What is going to be presented here is, of course, far from a general theory; however it is his hope that this attempt would be the very first step towards the study of Gaussian random fields using variational calculus. Contents: White noise; Generalized functionals; Rotation group and harmonic analysis; Applications to Physics; Gaussian random fields. Keywords: Statistic processes. (kr)

DESCRIPTORS: (U)   *CALCULUS OF VARIATIONS, *STATISTICAL PROCESSES, *WHITE NOISE, CALCULUS, HARMONIC ANALYSIS, LECTURES, PHYSICS, ROTATION, SIZES(DIMENSIONS), STATE OF THE ART, THEORY.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A5.

AD-A221 253

AD-A221 251   9/3

AERODYNE RESEARCH INC BILLERICA MA

(U) Spectroscopic Diagnostics to Support Advanced Microelectronic Fabrication Techniques.

DESCRIPTIVE NOTE: Final rept. 1 Apr 84-31 Mar 87,

APR 85   33P

PERSONAL AUTHORS: Wormhoudt, Joda C.; Stanton, Alan C.

REPORT NO.   ARI-RR-469

CONTRACT NO.   F49620-84-C-0036

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
            TR-87-1913

UNCLASSIFIED REPORT

ABSTRACT: (U)   This is the first annual report on a program to develop laser spectroscopic diagnostics for detection of gas phase species important in fabrication processes for advanced semi-conductor materials. It has two objectives, to obtain quantitative spectroscopic data for these molecules, and to apply diagnostics to model fabrication systems. This report summarizes progress in the areas of investigation identified in the first year: chlorine atom detection using an infrared tunable diode laser, which will also be used to instrument a plasma etching reactor, and infrared and laser induced fluorescence spectroscopic studies of SiF2, CF2, and SiH2. Keywords: Diagnostic instrumentation; Electronic materials; Infrared absorption; Lasers; Laser-induced fluorescence microelectronic fabrication; Semiconductor processing; Spectroscopy. (jes)

DESCRIPTORS: (U)   *INFRARED LASERS, ABSORPTION, ATOMS, CHLORINE, DETECTION, DIAGNOSIS(GENERAL), DIAGNOSTIC EQUIPMENT, ELECTRONIC EQUIPMENT, FABRICATION, INFRARED RADIATION, LASER APPLICATIONS, LASER INDUCED FLUORESCENCE, LASERS, MATERIALS, MICROELECTRONICS, MODELS, MOLECULES, PROCESSING, SEMICONDUCTOR LASERS, SEMICONDUCTORS, SPECTROMETERS, SPECTROSCOPY, TUNABLE LASERS, VAPOR PHASES.

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DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 251   CONTINUED   AD-A221 248   7/3

                                        COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A1.

                                        (U) Synthesis of 13C and 2H-Labelled 2-
                                             Phenylcyclododecanones,

                                                  90   10P

                                        PERSONAL AUTHORS: Rao, V. P.; Wang, Jin-Feng; Turro,
                                          Nicholas J.; Doubleday, Charles, Jr

                                        CONTRACT NO.   AFOSR-90-0049

                                        PROJECT NO.   2303

                                        TASK NO.   B2

                                        MONITOR: AFOSR
                                                   TR-90-0380

                                                  UNCLASSIFIED REPORT

ABSTRACT: (U)   Carbon 13, labelled (1,2 and 1,12) and
perdeuterated derivatives of 2-phenyl cyclododecanones,
as precursors for labelled triplet flexible biradicals to
prove magnetic isotope effects at the radical centers on
the triplet decay dynamics, were synthesized. Isotopomers
of 2-phenylcyclododecanone-13C2-(1,2 and 1,12) were
synthesized from cyclododecanone-13C2-(1,12) by
dibromination, followed by phenylation with
lighiumdiphenyl-cuprate. cyclododecanone-13C2-(1,2) was
obtained from 1,10-dibromodecane via the following
sequence: (1) K13 CN; (2)hydrolysis; (3) esterification;
(4) acyloin condensation. Perdeuterio-2-
phenylcyclododecanone (95% isotopic purity) was prepared
from unlabelled 2-phenylcyclododecanone by a substitution
of deuterium for hydrogen by treatment with excess heavy
water, catalyzed with D2-reduced platinum oxide in the
presence of deuterium peroxide. Reprints. (KT)

DESCRIPTORS: (U)   *LABELED SUBSTANCES, *CARBON COMPOUNDS,
*OXIDES, *SYNTHESIS(CHEMISTRY), CHEMICAL REACTIONS,
CONDENSATION, DEUTERIUM, ESTERS, HEAVY WATER, HYDROGEN,
HYDROLYSIS, ISOTOPE EFFECT, PEROXIDES, REPRINTS,
SUBSTITUTES.

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                                                  PAGE   76   EVK11C

AD-A221 251

AD-A221 246   9/1   12/4

WISCONSIN UNIV-MADISON DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) The Problem of Robust Compensation for Systems with Unmodeled Dynamics.

DESCRIPTIVE NOTE: Final rept.   1 Jan 88-31 Dec 89,

DEC 89   92P

PERSONAL AUTHORS: Cobb, J. D.

CONTRACT NO.   AFOSR-88-0087

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0388

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report describes the results obtained during the two years of funding extending from 1/88 to 1/90 in support of our project entitled 'The problem of Robust Compensation for Systems with Unmodeled Dynamics.' The project has consisted of several lines of research which are quite distinct, but which show great promise toward combining them into a single comprehensive theory. Our goal has been to explore the problem of designing feedback control systems that are insensitive to the presence of high-frequency dynamics not accounted for explicitly in the mathematical model of the plant. Some of our previous work suggests that it is possible to design controllers which simultaneously stabilize a given nominal system as well as a large class of small singular perturbations of the system. Attached are six papers summarizing work which has been supported all or in part by the present grant and which either have appeared, have been accepted, or have been submitted for publication. (KR)

DESCRIPTORS: (U)   *CONTROL SYSTEMS, *FEEDBACK, *MATHEMATICAL MODELS, COMPREHENSION, DYNAMICS, HIGH FREQUENCY, PERTURBATIONS, THEORY.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A1.

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AD-A221 248   CONTINUED

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2, Platinum Oxide, Deuterium Peroxide, Phenylcyclododecane, Cyclododecanone, Dibromododecane,

AD-A221 248

AD-A221 234   12/5

PROGRAM DEVELOPMENT CORP   WHITE PLAINS NY

(U) Interactive Grid Generation on Small Computers.

DESCRIPTIVE NOTE: Final rept. 1 Aug 89-31 Jan 90.

JAN 90   48P

PERSONAL AUTHORS: Eiseman, Peter R.

CONTRACT NO.   F49620-89-C-0096

PROJECT NO.   3005

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0505

UNCLASSIFIED REPORT

ABSTRACT: (U)   At the start of Phase I, there were
several 2D single block codes and a basic mathematical
structure for such codes. During the Phase I research,
the feasibility for general 2D multiblock code was firmly
established. The mathematical structure of the control
point form of algebraic grid generation (CCPF) was found
to provide the essential theoretical framework for the
codes and accordingly the necessary extensions of the CPF
were of central importance. These were considered along
with the important software techniques and the prototype
code. Within the scope of software techniques, the
elements of interactive graphics played a central role.
The prototype code provided a good test of important
ideas. Keywords: Fortran, Interpolation. (kr)

DESCRIPTORS: (U)   *GRIDS, *INTERACTIVE GRAPHICS, ALGEBRA,
CODING, COMPUTER PROGRAMMING, COMPUTERS, CONTROL CENTERS,
FORTRAN, INTERACTIONS, INTERPOLATION, MATHEMATICAL MODELS,
METHODOLOGY, PROTOTYPES.

IDENTIFIERS: (U)   PE65502F, WUAFOSR3005A1.

AD-A221 234

AD-A221 232   12/3

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC
PROCESSES

(U) On the Convergence of Finite Linear Predictors of
Stationary Processes,

AUG 89   15P

PERSONAL AUTHORS: Pourahmadi, Mohsen

CONTRACT NO.   F49620-85-C-0144, F49620-82-C-0009

PROJECT NO.   2304

TASK NO.   A5

MONITOR: AFOSR
            TR-90-0399

UNCLASSIFIED REPORT

ABSTRACT: (U)   It is shown in this reprint that the
finite linear least-squares predictor of a multivariate
stationary process converges to its Kolmogorov-Wiener
predictor at an exponential rate, provided that the
entries of its spectral density matrix are smooth
functions. Also, the same rate of convergence holds for
the partial sums of the Kolmogorov-Wiener predictor. (KR)

DESCRIPTORS: (U)   *MULTIVARIATE ANALYSIS, *CONVERGENCE,
*STATIONARY, EXPONENTIAL FUNCTIONS, FUNCTIONS, LEAST
SQUARES METHOD, LINEAR SYSTEMS, MATHEMATICAL PREDICTION,
PREDICTIONS, RATES, REPRINTS, STATISTICAL PROCESSES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A5.

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 228   1/1   12/2

GEORGIA INST OF TECH ATLANTA SCHOOL OF AEROSPACE
ENGINEERING

(U) Studies in Non-Linear Unsteady Aerodynamics.

DESCRIPTIVE NOTE: Final rept. Apr 86-Mar 88,

MAR 89   63P

PERSONAL AUTHORS: Wu, J. C.

CONTRACT NO.   AFOSR-86-0121

PROJECT NO.   2307

TASK NO.   A3

MONITOR: AFOSR
TR-90-0389

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report describes the research effort
carried out under AFOSR Grant 86-0121. Two new unified
theoretical-computational methods for analyzing unsteady
aerodynamics involving rapid large amplitude motion of
lifting bodies are described. One method is based on the
zonal solution of the full Navier-Stokes equation and the
other method is a simplified zonal method. Selected
results are presented for two-dimensional rigid,
articulate and flexible lifting bodies. Preliminary
results for three-dimensional problems are also presented.
Unsteady aerodynamics, Supermaneuverability. (EG)

DESCRIPTORS: (U)   *AERODYNAMIC CHARACTERISTICS,
*NONLINEAR SYSTEMS, *UNSTEADY FLOW, AMPLITUDE, FLEXIBLE
STRUCTURES, LIFTING BODIES, MOTION, NAVIER STOKES
EQUATIONS, SIMPLIFICATION, SOLUTIONS(GENERAL), THREE
DIMENSIONAL.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2307A3.

AD-A221 228

AD-A221 227   3/1   14/4

GEORGIA STATE UNIV ATLANTA CENTER FOR HIGH ANGULAR
RESOLUTION ASTRONOMY

(U) Super-Diffraction Limited Measurements through the
Turbulent Atmosphere by Speckle Interferometry.

DESCRIPTIVE NOTE: Final technical rept. 15 May 86-14 Nov
89,

FEB 90   219P

PERSONAL AUTHORS: McAlister, Harold A.

CONTRACT NO.   AFOSR-86-0134

PROJECT NO.   2311

TASK NO.   A1

MONITOR: AFOSR
TR-90-0492

UNCLASSIFIED REPORT

ABSTRACT: (U)   Speckle interferometric methods provide a
means for reconstructing diffraction limited images from
atmospherically blurred image data obtained in snapshots
with exposure times shorter than the atmospheric
redistribution time, typically shorter than 20
milliseconds. Several areas of research were emphasized:
(1) Speckle Photometry - The extraction of the
differential brightness and color of the components of
close binary stars has always been a fundamental limit to
the usefulness of these objects to stellar astrophysics.
Simple and fast methods were developed and applied to
actual data which enable the measurement of these
parameters for large numbers of stars. Newly developed
algorithms include a directed vector-autocorrelation (DVA)
technique for eliminating the 180 deg quadrant ambiguity
inherent in speckle interferometric measurements of the
astrometry of binary stars. DVA is a simple extension of
normal vector-autocorrelation and requires orders of
magnitude less computing time that standard image
reconstruction methods when applied to binary stars. The
second new algorithm is known as the fork method and
provides a means for a statistically based determination
of the intensity ratio of a binary at any selected
wavelength, thereby providing color information through

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the comparison of any two wavelengths. (2) Super Diffraction-Limited Detection - The very high accuracy of speckle astrometry provides a leveraging method for detecting close companions whose spatial separations are far less than the diffraction limit. In principle, this accuracy is sufficient to detect brown dwarf stars and high-mass plants in orbit around one component of a wide binary system. (JHD)

DESCRIPTORS: (U)   *PHOTOGRAPHIC ANALYSIS, *BINARY STARS, *IMAGE PROCESSING, *SPECULAR REFLECTION, ACCURACY, ALGORITHMS, ASTROPHYSICS, ATMOSPHERES, BRIGHTNESS, COLORS, DETECTION, DETERMINATION, DIFFRACTION, DWARF STARS, EXPOSURE(GENERAL), HIGH RATE, INTENSITY, INTERFEROMETRY, LIMITATIONS, MEASUREMENT, METHODOLOGY, PHOTOMETRY, RATIOS, SEPARATION, SPATIAL DISTRIBUTION, SPHERICAL ASTRONOMY, STANDARDIZATION, STARS, TURBULENCE.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2311A1.

AD-A221 224   8/15

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF BRAIN AND COGNITIVE SCIENCES

(U) Strategies to Sustain and Enhance Performance in Stressful Environments.

DESCRIPTIVE NOTE: Final rept. 30 Sep 87-14 Dec 89,

MAR 90   24P

PERSONAL AUTHORS: Lieberman, Harris R.; Dollins, Andrew B. ; Wurtman, Richard J.

CONTRACT NO.   AFOSR-87-0402

PROJECT NO.   2312

TASK NO.   A2

MONITOR: AFOSR
TR-90-0403

UNCLASSIFIED REPORT

ABSTRACT: (U)   Tyrosine, a large neutral amino acid normally present in protein foods, is the precursor of the catecholamine neurotransmitters dopamine, norepinephrine, and epinephrine. Animal studies indicate that systemic administration of tyrosine in pharmacologic quantities can reduce physiological and behavioral decrements induced by highly stressful conditions. The current study was designed to test the effects of tyrosine on humans exposed to cardiovascular stress. Physiological (HR, BP, AER, EOG, & EMG) and Behavioral (Rt, Mood, & Vigilance) indices were monitored during testing. Comparisons indicate that the effects of tyrosine ingestion include: 1) overall increase in pulse pressure (LBNP typically reduces pulse pressure). 2) an increase in P300 amplitude (indicating increased cognitive activity) when participating in the odd-ball task. 3) a non-significant increase (22%) in LBNP tolerance among subjects who could not withstand LBNP for the full 30 minute period. Results of this study indicate that elevated blood plasma tyrosine levels reduce physiological decrements caused by LBNP stress. Keywords: Tyrosine; Large Neutral Amino Acids(LNAA); Lower Body Negative Pressure(LBNP); Pulse. (kt)

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DESCRIPTORS: (U)   *AMINO ACIDS, *PERFORMANCE(HUMAN),
*CATECHOLAMINES, *STRESS(PHYSIOLOGY), *PHARMACOKINETICS,
*NOREPINEPHRINE, ANIMALS, BEHAVIOR, CARDIOVASCULAR SYSTEM,
COGNITION, DEGRADATION, DOPAMINE, EPINEPHRINE, FOOD,
HUMANS, INGESTION(ENGINES), NEUROMUSCULAR TRANSMISSION,
NEUTRAL, PHARMACOLOGY, PHYSIOLOGY, PRESSURE, PROTEINS,
PULSES, QUANTITY, STRESSES, TYROSINE.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2312A2.

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DOUGLAS AIRCRAFT CO   LONG BEACH CA

(U)   An Interactive Boundary-Layer Method for Unsteady
Airfoil Flows. 1. Quasi-Steady-State Model.

DESCRIPTIVE NOTE: Final technical rept.   1 Jan 88-31 Dec
89,

FEB 90   29P

PERSONAL AUTHORS: Cebeci, Tuncer; Jang, Hong-Ming

REPORT NO.   MDC-K4856

CONTRACT NO.   F49620-88-C-0020

PROJECT NO.   2307

TASK NO.   A3

MONITOR: AFOSR
TR-90-0404

UNCLASSIFIED REPORT

ABSTRACT: (U)   An interactive boundary-layer method
previously developed and tested for steady flows is used
here in a quasi-steady manner to examine the evolution of
the flow behavior of airfoils subject to harmonic
oscillation and ramp-type motions. The calculations
encompass the airfoil and wake flows at angles of attack
which lead to separation. The results quantify the
effects of the viscous boundary layer and wake on the
variation of lift coefficient with angle of attack and
reduced frequency. These effects are shown to be large at
angles of attack which involve boundary-layer separation.
Keywords: Boundary layer flow; Flow separation; Fluid
mechanics; Oscillating airfoils; Stalling; Lift
coefficients; Unsteady motion. (edc)

DESCRIPTORS: (U)   *AIRFOILS, *BOUNDARY LAYER FLOW, *FLOW
SEPARATION, *WAKE, ANGLE OF ATTACK, BOUNDARY LAYER,
COEFFICIENTS, FLUID MECHANICS, FREQUENCY, HARMONICS,
INTERACTIONS, LIFT, OSCILLATION, REDUCTION, STALLING,
STEADY FLOW, UNSTEADY FLOW, VISCOUS FLOW.

IDENTIFIERS: (U)   Harmonic oscillation, Lift coefficients,
Viscous boundary layer, PE61102F, WUAFOSR2307A3.

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AD-A221 218   20/8

CALIFORNIA UNIV BERKELEY LAWRENCE BERKELEY LAB

(U) X-Ray Optics.

DESCRIPTIVE NOTE: Final rept. 15 Oct 86-29 Sep 89,

JAN 90   29P

PERSONAL AUTHORS: Attwood, David T., Jr

CONTRACT NO.   F49620-87-K-0001

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0518

UNCLASSIFIED REPORT

ABSTRACT: (U)   Progress was made in diffractive x-ray
microscopy, multilayer mirrors for x-ray imaging and
laser applications, soft x-ray imaging and spectroscopy
of biological samples, and computer simulations of x-ray
optical trains. (jhd)

DESCRIPTORS: (U)   *MICROSCOPES, *DIFFRACTION, *X RAYS,
COMPUTERIZED SIMULATION, OPTICAL IMAGES, LASER
APPLICATIONS, LAYERS, MICROSCOPY, MIRRORS, OPTICAL
PROPERTIES, OPTICS, SAMPLING, SOFT X RAYS, SPECTROSCOPY.

IDENTIFIERS: (U)   WUAFOSR2301A1, PE61102F.

AD-A221 216   22/1   12/2

VIRGINIA POLYTECHNIC INST AND STATE UNIV BLACKSBURG DEPT
OF ENGINEERING SCIEN CE AND MECHANICS

(U) Control of Large Space Structures.

DESCRIPTIVE NOTE: Final rept. 1 Feb 88-31 Jan 89,

FEB 90   35P

PERSONAL AUTHORS: Meirovitch, Leonard

CONTRACT NO.   F49620-88-C-0044

PROJECT NO.   2302

TASK NO.   B1

MONITOR: AFOSR
           TR-90-0515

UNCLASSIFIED REPORT

ABSTRACT: (U)   Work during this period was concerned with:
1) development of a new method for the derivation of the
state equations of motion for the control of flexible
spacecraft in terms of quasi-coordinates; and 2)
development of a method for the control of spacecraft in
the form of articulated flexible multi-bodies. Keywords:
Maneuvering flexible appendages; Equations of motion;
Flexible structures; Control systems; Control laws; Line
of sight; Spacecraft antennas/alignment; Vibration. (edc)

DESCRIPTORS: (U)   *CONTROL SYSTEMS, *EQUATIONS OF MOTION,
*FLEXIBLE STRUCTURES, *SPACECRAFT COMPONENTS, ALIGNMENT,
APPENDAGES, CONTROL, CONTROL THEORY, EQUATIONS OF STATE,
GRIDS(COORDINATES), LINE OF SIGHT, MANEUVERABILITY,
SPACECRAFT, SPACECRAFT ANTENNAS, VIBRATION.

IDENTIFIERS: (U)   Articulate structures, Large space
structures, Flexible spacecraft, WUAFOSR2302B1, PE61102F.

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 215   20/12

CERAM PHYSICS INC WESTERVILLE OH

(U) Research on High-Specific-Heat Dielectrics.

DESCRIPTIVE NOTE: Final rept. 1 Apr 86-31 Aug 89,

JAN 90   391P

PERSONAL AUTHORS: Lawless, W. N.

CONTRACT NO.   F49620-86-C-0049

PROJECT NO.   2301

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0502

UNCLASSIFIED REPORT

ABSTRACT: (U)   A large amount of experimentation has been performed on ceramic samples of zinc chromite and cadmium chromite prepared under new conditions of doping, stress, purity, and particle size. No structures in the specific heats of these spinels are induced above 15 K by wide variations in one or all of these conditions. Under various doping conditions, the specific heat peak in cadmium chromite can be sharpened, broadened, or eliminated, but not split. In contrast, the specific heat peak in zinc chromite is easily spit into two components by all dopants studied. Calorimetric, magnetic susceptibility, and EPR measurements are in basic agreement in characterizing these effects. (JES)

DESCRIPTORS: (U)   *DOPING, AGREEMENTS, CALORIMETERS, CERAMIC MATERIALS, MAGNETIC PROPERTIES, PARTICLE SIZE, PEAK VALUES, PURITY, SAMPLING, SPECIFIC HEAT, SPINEL.

IDENTIFIERS: (U)   WUAFOSR2301B2, PE61102F.

AD-A221 214   9/3

CALIFORNIA UNIV LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Light-Millimeter Wave Interactions in Semiconductor Devices.

DESCRIPTIVE NOTE: Final rept. 1 Jan 86-31 Mar 89,

JAN 90   132P

PERSONAL AUTHORS: Fetterman, Harold R.

CONTRACT NO.   F49620-86-K-0007

PROJECT NO.   2305

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0511

UNCLASSIFIED REPORT

ABSTRACT: (U)   The investigation focussed on the nature of optical-millimeter wave interactions in high frequency semiconductor devices. It relied primarily upon optical mixing between frequency locked lasers but also included picosecond studies with a number of different laser systems. Actual devices investigated ranged from FETs to high frequency HEMTs(High Electron Mobility Transistors) and HBTs(Heterojunction Bipolar Transistors.) The actual experiments ranged using optical techniques to obtain fundamental physical information about the nature of these devices at high frequencies to investigating optical control and new application areas. The devices range from special configurations developed at UCLA to advanced, submicron, GaAs alloy devices fabricated in local high technology research laboratories. (JES)

DESCRIPTORS: (U)   *LASERS, ALLOYS, CONFIGURATIONS, CONTROL, GALLIUM ARSENIDES, HIGH FREQUENCY, METHODOLOGY, MIXING, OPTICAL PROPERTIES, OPTICS, PHYSICAL PROPERTIES, SEMICONDUCTOR DEVICES.

IDENTIFIERS: (U)   WUAFOSR2305B2, PE61102F.

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SEARCH CONTROL NO. EVK11C

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PENNSYLVANIA STATE UN''   UNIVERSITY PARK DEPT OF
MECHANICAL ENGINEERIN

(U) Development of a Postprocessing and 3D Graphical
Imaging Facility.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov
89,

JAN 90   6P

PERSONAL AUTHORS: Brasseur, James G.

CONTRACT NO.   AFOSR-89-0139

PROJECT NO.   2307

TASK NO.   A2

MONITOR: AFOSR
TR-90-0374

UNCLASSIFIED REPORT

ABSTRACT: (U)   This grant supported the acquisition of
equipment towards the development of what has been termed
a Postprocessing and 3D Graphical Imaging Facility. The
primary function of the facility is in the analysis of
numerical and experimental data, perhaps created in other
laboratories, through the combination of quantitative and
graphical tools. Specifically, the motivation is the
analysis of Full Numerical Simulations of turbulent flows
to study time-dependent three-dimensional structural
characteristics and the interrelationships among
turbulent structures in different fluctuating variables.
The hardware purchases towards these ends includes two
Stardent Titan graphics 'mini-super-computers', one with
32 Mb memory and a single CPU, and the other with 64 Mb
memory and two CPU's, both fully loaded with enhanced
graphics, FORTRAN and C compilers and other software,
nearly 3 Gb hard disk storage. a thermal color printer, a
laser printer, and an X-terminal. The facility is fully
networked as an Internet node. Some College matching
funds remain. These will be combined with other funding
sources to purchase hardware and software for the
recording of animated sequences on video tape. Keywords:
Flow visualization. (kr)

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OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) Unimolecular Dissociation Dynamics of Disilane.

JAN 90   16P

PERSONAL AUTHORS: Agrawal, Paras M.; Thompson, Donald L.;
Raff, Lionel M.

CONTRACT NO. AFOSR-89-0085

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-90-0376

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v92
n2 p1069-1082. 15 Jan 90.

ABSTRACT: (U)   The unimolecular dissociation dynamics of
disilane are investigated using classical trajectory
methods with a global potential-energy surface fitted to
the available experimental data and the results of
various ab initio calculations. The potential surface is
written as the sum of 52 many body terms containing 86
adjustable parameters which are fitted to experimental
and/or calculated data for stationary point geometries,
fundamental vibrational frequencies, reaction endo-and
exothermicities, and potential-energy barrier heights for
reactions of disilane and molecules derived from disilane.
The predicted heats of reaction for 13 reactions
involving disilane or its derivatives are in good accord
with the experimental and ab initio results. The average
absolute deviation is 3.55 kcal/mol. (JES)

DESCRIPTORS: (U) *SILANES, DISSOCIATION, DYNAMICS,
EXPERIMENTAL DATA, FREQUENCY, MOLECULES, STATIONARY,
SURFACES, TRAJECTORIES, VIBRATION.

IDENTIFIERS: (U) PE61102F, WUAFOSR2303B3.

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AD-A221 210   20/6   9/5

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
PHYSICS

(U) 'Optical Phase Conjugation in Photorefractive
Materials'.

DESCRIPTIVE NOTE: Final rept. 1 Jul 85-30 Jul 88,

OCT 88   25P

PERSONAL AUTHORS: Feinberg, J.

CONTRACT NO. F49620-85-C-0110

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-89-0271

UNCLASSIFIED REPORT

ABSTRACT: (U)   The photorefractive crystal barium
titanate has been studied for its inherent physical
properties and for its applications, including the
locking together of separate laser beams. The output
beams of two separate argon-ion lasers were locked
together to within less than one Hz for an indefinite
time. The technique uses four-wave mixing in the barium
titanate crystal. A ring self-pumped phase conjugator was
altered by inserting a nonreciprocal phase element in the
ring so as to break its time-reversal symmetry. The
device could be made to produce controlled frequency
shifts and new output modes. Applications of this device
are in mode conversion for optical computing. A transient
detection microscope was invented which displays the
images of moving objects, and which removes the
stationary background. This all-optical device uses two-
wave mixing in a barium titanate crystal. Keywords: Phase
conjugation; Lasers; Photorefraction Barium titanate;
Optical computing. (jhd)

DESCRIPTORS: (U) *BARIUM TITANATES, *OPTICAL PROCESSING,
ARGON LASERS, COMPUTATIONS, CONTROL, CONVERSION, CRYSTALS,
DETECTION, FREQUENCY, FREQUENCY SHIFT, IMAGES, LASER
BEAMS, LASER APPLICATIONS, MICROSCOPES, MIXING, MOVING
TARGETS, OUTPUT, PHYSICAL PROPERTIES, TRANSIENTS.

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NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Harmonizability, V-Boundedness, (2,p)-Boundedness of
     Stochastic Processes,

90   17P

PERSONAL AUTHORS: Houdre, Christian

REPORT NO.   TR-239

CONTRACT NO.   F49620-85-C-0144

MONITOR: AFOSR
            TR-90-0400

UNCLASSIFIED REPORT

ABSTRACT: (U)   Some new classes of discrete time non-
stationary processes, related to the Harmonizable and V-
bounded classes, are introduced. A few characterizations
are obtained which, in turn, unify the V-bounded theory.
Our main results depend on a special form of
Grothendieck's inequality. Keywords: Reprints. (KR)

DESCRIPTORS: (U)   *STOCHASTIC PROCESSES, REPRINTS, TIME,
INEQUALITIES.

IDENTIFIERS: (U)   Grothendiecks inequality.

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IDENTIFIERS: (U)   PE61102F, WUAFOSR2301A1, Phase
Conjugation, Two Wave Mixing, Argon Ion Lasers,
Photorefraction.

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CORNELL UNIV ITHACA NY LAB OF ATOMIC AND SOLID STATE   STANFORD UNIV CA DEPT OF MECHANICAL ENGINEERING
PHYSICS

(U) A Scanning Tunneling Microscope for Ultrahigh Vacuum   (U) Planar Laser-Induced Fluorescence Imaging.
    Atom-Surface Interaction Studies,

FEB 90   6P   88   19P

PERSONAL AUTHORS: Peale, D. R.; Cooper, B. H.   PERSONAL AUTHORS: Hanson, Ronald K.

CONTRACT NO.   AFOSR-88-0069   CONTRACT NO.   AFOSR-87-0057

PROJECT NO.   2303   PROJECT NO.   2308

TASK NO.   A2   TASK NO.   A3

MONITOR: AFOSR   MONITOR: AFOSR
           TR-90-0382   TR-90-0393

           UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

ABSTRACT: (U)   A compact, mechanically stable and
thermally compensated tunneling microscope has been
designed for use in an ultrahigh vacuum (UHV) surface
characterization and analysis system. Very small
concentric tubular scanning elements provide mechanical
rigidity, thermal stability, and minimal cross coupling
of the X, Y, and Z motions. The compact load-locking
design provides full compatibility with the rest of the
UHV analysis system without requiring that a
disproportionately large fraction of the vacuum system be
devoted to the microscope. Reported here is the design of
the microscope and load-lock system, and the results of
tests using the microscope in air to image the surfaces
of graphite and gold. Reprints. (jhd)

ABSTRACT: (U)   New measurement techniques based on planar
(2-d) imaging of scattered light provide a powerful
complement to single-point laser-based diagnostics, with
significant potential to impact combustion research.
Though still in an early stage of development, these
imaging methods offer prospects for non-invasive,
spatially and temporally resolved measurements of species
concentrations and mole fractions, temperature, density,
velocity, and pressure. Imaging processes encompassed in
this review include laser-induced fluorescence and Raman,
Mie and Rayleigh scattering. Extensions of these 2-d
techniques to new flowfield variables and species, and to
3-d imaging by rapid scanning of the illumination plane,
are already in progress. Keywords: Raman/mie scattering;
Laser-based diagnostics; Optical scanning; Reprints. (edc)

DESCRIPTORS: (U)   *SCANNING ELECTRON MICROSCOPES,
*TUNNELING(ELECTRONICS), *SURFACE PROPERTIES,
COMPATIBILITY, GOLD, GRAPHITE, IMAGES, MECHANICAL
PROPERTIES, REPRINTS, RIGIDITY, SURFACES, TEST AND
EVALUATION, THERMAL STABILITY, ULTRAHIGH VACUUM, VACUUM
APPARATUS.

DESCRIPTORS: (U)   *COMBUSTION, *DIAGNOSIS(GENERAL),
*IMAGES, *LASER INDUCED FLUORESCENCE, *LIGHT SCATTERING,
CONCENTRATION(CHEMISTRY), DENSITY, FLOW FIELDS, HIGH RATE,
ILLUMINATION, LASER APPLICATIONS, MEASUREMENT,
METHODOLOGY, MIE SCATTERING, OPTICAL SCANNING, PLANAR
STRUCTURES, PRESSURE MEASUREMENT, RAMAN SPECTRA, RAYLEIGH
SCATTERING, REPRINTS, SCANNING, TEMPERATURE, TEMPERATURE
MEASURING INSTRUMENTS, THREE DIMENSIONAL, TWO DIMENSIONAL.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A2.

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VARIABLES.

IDENTIFIERS: (U) *Imaging methods, Raman scattering,
Laser scanning, Laser based diagnostics, PE61102F,
WUAFOSR2308A8.

AD-A221 191   12/1   12/4

RUTGERS - THE STATE UNIV NEW BRUNSWICK NJ HILL CENTER
FOR THE MATHEMATICAL S CIENCES

(U) A RUTCOR Project in Discrete Applied Mathematics.

DESCRIPTIVE NOTE: Final technical rept. 1 Nov 88-31 Oct
89,

FEB 90   74P

PERSONAL AUTHORS: Hammer, Peter L.; Roberts, Fred S.

CONTRACT NO.   AFOSR-89-0066

PROJECT NO.   2304

TASK NO.   B1

MONITOR: AFOSR
             TR-90-0390

UNCLASSIFIED REPORT

ABSTRACT: (U)   This project has been concerned with
research in discrete mathematics and its applications.
The work has involved theoretical developments, the
development of new algorithms, and the application of
discrete methods to practical problems. There have been
five major areas of emphasis. The first, graph theory and
its applications, has been concerned with graph coloring
and stability and their applications, with special
classes of graphs (such as perfect graphs, threshold
graphs, competition graphs), and with the use of graphs
to solve discrete optimization problems. The second area
has involved discrete optimization, and has emphasized
location problems, preprocessing and decomposition
methods for solving such problems and applications of
combinatorial optimization to nonlinear pro'ems (global
optimization). The third area of emphasis has been on
combinatorial structures and their applications. The
fourth area has been the development of efficient
algorithms for discrete problems. The fifth area of
emphasis has been applications of discrete mathematics to
decisionmaking. (KR)

DESCRIPTORS: (U)   *APPLIED MATHEMATICS, ALGORITHMS,
COLORING, COMBINATORIAL ANALYSIS, DECOMPOSITION, DECISION
MAKING, EFFICIENCY, GLOBAL, GRAPHS, MATHEMATICS,

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SEARCH CONTROL NO. EVK11C

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NONLINEAR SYSTEMS, OPTIMIZATION, STRUCTURES, THEORY,
THRESHOLD EFFECTS.

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304B1.

(U) 1,4-Dibromohomocubane Ethylene Ketal.

89   4P

PERSONAL AUTHORS: Watson, William H.; Kashyap, Ram P.;
Marchand, Alan P.; Vidyasagar, V.

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0490

UNCLASSIFIED REPORT

ABSTRACT: (U)   The X-ray crystal structure of 1,4-
dibromohomocubane ethylene ketal is reported. The gage
structure consists of four four-membered rings fused to a
norbornane moiety (two fused five-membered rings) with an
ethylene ketal attached to the methylene bridge of the
norbornane. Two four-membered rings are planar and two
are folded along a diagonal. The five-membered ethylene
ketal ring is in an envelope conformation but the flap is
not at the spiro fusion center with the cage. Reprints.
(KT)

DESCRIPTORS: (U)   *CRYSTAL STRUCTURE, *ETHYLENE, BRIDGES.
CONFORMITY. ENVELOPE(SPACE), GAGES, METHYLENES, REPRINTS.
X RAYS.

IDENTIFIERS: (U)   *Ketals, *Ethylene Ketal.

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SEARCH CONTROL NO. EVK11C

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UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Graduate Student Research
Program. 1989 Program Technical Report. Volume 2.

DESCRIPTIVE NOTE: Annual rept.,

DEC 89   410P

PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.

PROJECT NO.   3396

TASK NO.   D5

MONITOR: AFOSR
          TR-90-0371

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A219 897.

ABSTRACT: (U)   Partial contents: Study of Jc in high Tc
superconductors using a magnetic induction method; Design
of an LDV data analysis system; Preparation of a dump
combustor for LDA measurements; Laser induced
fluorescence probe of CH radical; Examination and
application of a one dimensional thermionic energy
converter (TEC) code; Band diagram subroutine and band
bending in the spike layer for the BICFET; Software
design recovery -- A case study; Neural networks and
machine learning; Implementation of an objective measure
of speech intelligibility; Radiative hypersonic
aerodynamics -- Numerical simulation of hypersonic flows
past slender wedges near the continuum limit; Validation
schemes for accelerated crazing tests and X3D -- A finite
element analysis code; Damage in graphite/epoxy plates
subjected to low velocity impact; Control system design
modelling; Accessing the computer automated design
database (CADDAB) through CADS -- A computer aided design
system; Dislocations in Rene N4+ with respect to
orientation and temperature; An approximate analytical
solution of the nonlinear diffusion equation and a
preliminary investigation of nonlinear optics; Synthesis
of model Benzothiazoles. Air Force research/laboratories.
(edc)

DESCRIPTORS: (U)   *AIR FORCE RESEARCH, ACCELERATED

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AD-A221 184   CONTINUED

TESTING, ACCESS, AERODYNAMICS, AIR FORCE FACILITIES,
ANALYTIC FUNCTIONS, BENZYL RADICALS, CODING, COMBUSTORS,
COMPUTER AIDED DESIGN, COMPUTER PROGRAMS, CONTROL SYSTEMS.
CRAZING, DATA BASES, DATA PROCESSING, DIFFUSION,
DISLOCATIONS, FIELD EFFECT TRANSISTORS, EQUATIONS, FINITE
ELEMENT ANALYSIS, GRAPHITE EPOXY COMPOSITES, HYDROCARBONS.
HYPERSONIC FLOW, IMPACT, INTELLIGIBILITY, LABORATORIES,
LASER INDUCED FLUORESCENCE, LASER VELOCIMETERS, LAYERS.
LEARNING MACHINES, LIMITATIONS, LOW VELOCITY, MAGNETIC
INDUCTION, MATHEMATICAL MODELS, MODELS, NEURAL NETS,
NICKEL ALLOYS, NONLINEAR SYSTEMS, NUMERICAL ANALYSIS.
OPTICS, PLATES, PROBES, RADIATION, RECOVERY, SLENDER
BODIES, SOLUTIONS(GENERAL), SPEECH, SPIKES,
SUPERCONDUCTORS, SYNTHESIS(CHEMISTRY), THERMIONIC
CONVERTERS, THIAZOLES, VALIDATION, WEDGES.

IDENTIFIERS: (U)   Laser doppler velocimeters, Nonlinear
optics, Dump combustors, Benaothiazoles, PE61102F,
WUAFOSR3396D5.

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 156   7/3

NEW MEXICO UNIV ALBUQUERQUE DEPT OF CHEMISTRY

(U) Conformation-Dependent Effects of the Nitro Group upon Some Strained Tertiary C-C Bonds.

DESCRIPTIVE NOTE: Journal article,

90   6P

PERSONAL AUTHORS: Grodzicki, Michael; Seminario, Jorge M.; Politzer, Peter

CONTRACT NO.   AFOSR-88-0068

PROJECT NO.   2303

TASK NO.   B3

MONITOR: AFOSR
               TR-90-0377

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v94 n2 p624-628 1990.

ABSTRACT: (U)   Computational studies (SCF-MO, 3-21G) have shown that an NO2 substituent can have a weakening effect on strained tertiary C-C bonds, depending upon its conformation relative to these bonds. This is particularly significant when the C-C-N plane is perpendicular to that of the NO2. The weakening is greatly reinforced when an NH2 group is on the other carbon of the C-C bond; indeed, the 'perpendicular' conformer of aminonitrotetrahedrane was found to undergo a rearrangement to 1-amino-3-nitrocyclobutadiene. This does not happen for the corresponding monoaza system nor does any significant bond weakening take place in the unstrained nitroethane and 1-amino-2-nitroethane molecules. Bond weakening; Nitro group; Amino group; Bond order; Tetrahedrane; Azatetrahedrane. (JES)

DESCRIPTORS: (U)   *ORGANIC MATERIALS, AMINES, BONDING, CARBON, COMPUTATIONS, CONFORMITY, NITRO RADICALS, NITROETHANE.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B3.

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AD-A221 139   14/2

WASHINGTON UNIV SEATTLE DEPT OF CIVIL ENGINEERING

(U) (DURIP) Instrumentation for Data Acquisition and Control of Structural Experiments.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov 89,

JAN 90   10P

PERSONAL AUTHORS: Roeder, Charles W.

PROJECT NO.   3842

TASK NO.   A1

MONITOR: AFOSR
               TR-90-0401

UNCLASSIFIED REPORT

ABSTRACT: (U)   This project provided instrumentation for dynamic data acquisition and experimental control for dynamic testing of materials and structural systems in the Structural Research Laboratory of the Dept. of Civil Engineering. The project resulted in the purchase of equipment to attain an intermediate speed data acquisition, to increase the number of channels of the very high speed data acquisition capability and to assure that these dynamic data acquisition systems are compatible with existing low speed data acquisition systems and the computers used for interpretation and analysis of the data. The project resulted in the purchase of equipment for the development of a simple computer based interactive control system for the loading devices. This capability will result in more efficient use of the laboratory facilities, and in the application of more realistic loads and deformations to the structure. The project included only funding for the purchase of the equipment, but a substantial portion of the software development for interactive testing has been completed with work paid for by another research project. In addition, enhanced computing facilities have been developed to assist in this effort through additional funding. The combined effects of these contributions greatly enhances the experimental capabilities of the laboratory. (EDC)

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DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 139   CONTINUED

DESCRIPTORS: (U) *LABORATORY EQUIPMENT, *STRUCTURAL
ENGINEERING, CIVIL ENGINEERING, COMPUTER PROGRAMS,
COMPUTERS, CONTROL, DATA ACQUISITION, DEFORMATION,
DYNAMIC TESTS, EFFICIENCY, INSTRUMENTATION, INTERACTIONS,
LABORATORIES, LOADERS, MATERIALS, RESEARCH FACILITIES,
STRUCTURAL PROPERTIES, TEST AND EVALUATION.

IDENTIFIERS: (U) PE61102F, WUAFOSR3842A1.

AD-A221 138   20/6

YALE UNIV NEW HAVEN CT DEPT OF APPLIED PHYSICS

(U) Increased Sensitivity of a Vidicon Optical
Multichannel Analyzer with a Detachable Electrostatic
Image Intensifier,

AUG 86   4P

PERSONAL AUTHORS: Snow, Judith B.; Zheng, Jia-Biao; Chang,
Richard K.

REPORT NO.   3

CONTRACT NO.   F49620-85-K-0002

PROJECT NO.   2308

TASK NO.   A3

MONITOR: AFOSR
TR-90-0405

UNCLASSIFIED REPORT

ABSTRACT: (U)   The advantages of multichannel detection
with an optical multichannel analyzer (OMA) have been
well documented. These advantages include fast data
acquisition, broadband spectral response, and the ability
to monitor time development of a system. One commonly
used 2-D OMA detector is the SIT(Silicon Intensified
Target) vidicon, which is essentially a low-light-level
TV camera. We report a substantial gain in sensitivity
through the addition of a commercially available
electrostatic image intensifier to a SIT vidicon system.
This relatively low-cost modification allows cooled or
room temperature operation, cw or pulsed detection, and
ease of removal or addition. The latter feature is
important since increased sensitivity is not required for
some applications. Keywords: Image intensifier; Coherent
anti-Stokes scattering; Silicon intensified target
vidicon, Optical multichannel analyzer. (JES)

DESCRIPTORS: (U) *IMAGE INTENSIFIERS(ELECTRONICS),
*MULTICHANNEL, *OPTICAL EQUIPMENT, ANALYZERS, BROADBAND,
COHERENT SCATTERING, COOLING, DATA ACQUISITION, DETECTION,

AD-A221 138

DTIC REPORT BIBLIOGRAPHY

AD-A221 138   CONTINUED

AD-A221 137   7/3

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

ELECTROSTATICS, LOW COSTS, LOW LIGHT LEVELS, MODIFICATION, OPERATION, PULSES, RESPONSE, ROOM TEMPERATURE, SILICON, SPECTRA, STOKES RADIATION, TARGETS, TELEVISION CAMERAS, TEMPERATURE, TIME, VIDICONS.

(U) Molecular Weight and Comparative Studies of Poly-3- and Poly-4-BCMU Monolayers and Multilayers,

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A3.

90   10P

PERSONAL AUTHORS: Biegajski, J. E.; Burzynski, R.; Cadenhead, D. A.; Prasad, P. N.

CONTRACT NO.   F49620-87-C-0042

PROJECT NO.   2303

TASK NO.   A3

MONITOR: AFOSR
TR-90-0410

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Macromolecules, v23 n3 p816-823 1990.

ABSTRACT: (U)   The molecular weights of three poly-4-BCMU samples were determined with a film balance technique by assuming near ideal behavior at low film concentrations. For the high, medium, and low molecular weight samples the number-average molecular weights were 410 000, 300 000, and 66 000 g/mol, respectively. All three samples showed a monolayer/bilayer, yellow coil/red rod conformational change similar to those we previously reported; 1 however, the low molecular weight sample initiated the compressional transition at a significantly lower area/residue than did either the medium or high molecular weight samples. This was interpreted to mean that the shorter chains in the low molecular weight sample has an increased number of semisoluble end groups. (JES)

DESCRIPTORS: (U)   *ORGANIC CHEMISTRY, BALANCE, BEHAVIOR, CHAINS, COILS, CONCENTRATION(COMPOSITION), FILMS, LIGHTWEIGHT, LOW LEVEL, MOLECULAR WEIGHT, RODS, SAMPLING, YELLOW(COLOR).

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A3.

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AD-A221 138

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A221 131   6/11

AD-A221 131   CONTINUED

TOPICAL TESTING INC   SALT LAKE CITY UT

(U) A Biological Model of the Effects of Toxic Substances.

DESCRIPTIVE NOTE: Final rept. 1 Jul 89-1 Jan 90,

FEB 90   43P

PERSONAL AUTHORS: Tuckett, Robert P.

REPORT NO.   400.4TC89

CONTRACT NO.   F49620-89-C-0099

PROJECT NO.   3005

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0517

UNCLASSIFIED REPORT

DESCRIPTORS: (U)   *ASSAYING, *DETOXIFICATION, *TOXIC
HAZARDS, *EXPOSURE(GENERAL), *EYE, AIR FORCE PERSONNEL,
BIOLOGY, CHEMICALS, CONJUNCTIVITIS, CORNEA, ENVIRONMENTS,
FEASIBILITY STUDIES, INPUT, LOW LEVEL, MILITARY
OPERATIONS, MODELS, NERVE CELLS, NERVES, PERMEABILITY,
POPULATION, SENSES(PHYSIOLOGY), TISSUE CULTURE,
TISSUES(BIOLOGY), TOXICITY, TOXICOLOGY, VISION.

IDENTIFIERS: (U)   *Biological models.

ABSTRACT: (U)   Due to the basic nature of military
operations, it is sometimes necessary for Air Force
personnel to be exposed to toxic chemicals in their work
environment either as a protracted low-level exposure or
as a high-level, acute exposure. The application herein
proposes to use the anterior eye (cornea and conjunctiva)
and its sensory innervation as an assay of toxic effects.
The anterior eye has unique characteristics: its
extensive use in toxicology, permeability, the relative
ease of observation, and importance to the input of
visual information. In addition, the eye is unique in
that receptors innervating the cornea differ from those
innervating conjunctiva and hence comparisons of these
populations will likely be useful to assay for deficits
in performance of different types of sensory neurons. The
personnel of Topical Testing have expertise in growing
(and recording from) neural tissue in culture, as well as
the design and fabrication of specialized equipment used
in such studies. This phase I feasibility study will
investigate the use of an ocular-neuronal model as an
indicator of toxic insult. Phase II development will
establish a model tissue culture system with an eventual
goal of investigating mechanisms to enhance natural
detoxification. (kr)

AD-A221 131   AD-A221 131

AD-A221 110   7/5   AD-A221 110   CONTINUED

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY   NUMERICAL METHODS AND PROCEDURES, PHYSICAL CHEMISTRY,
                                           REPRINTS, SPECTROSCOPY, STRUCTURES, TEST AND EVALUATION,
(U) Physical Organic Photochemistry,   THEORY.

                                           IDENTIFIERS: (U) PE61102F, WUAFOSR2303B2.
        90   5P

PERSONAL AUTHORS: Turro, Nicholas J.

CONTRACT NO.   AFOSR-90-0049

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0438

            UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Photochemistry and
    Photobiology, A: Chemistry, v51 p63-66 1990.

ABSTRACT: (U)   Physical organic photochemistry has been
concerned with the systematic investigation of structure-
reactivity relationships involved in the photophysics and
photochemistry of organic molecules. The field relies
heavily on the use of physical and computational methods
to elucidate mechanistic pathways that allow an
understanding of the molecular basis of observed or
predicted structure-reactivity relationships.
Determination of rate laws through kinetic analysis,
syntheses of 'tailor made' structures to test theories or
mechanisms, and the use of product structure has been the
dominant tool in physical organic chemistry and has shown
similar validity in physical organic photochemistry.
Reactive intermediates, which were postulated to explain
observed products, have played an important role in the
development of physical organic chemistry. In physical
organic photochemistry these reactive intermediates have
often been directly detected by time resolved
spectroscopic methods. Keywords: Reprints,
Instrumentation, Reaction dynamics, Products of radical
pairs, Magnetic fields, Electromagnetic radiation,
Triplet spin sublevel, Nuclear spin sublevel. (jg)

DESCRIPTORS: (U)   *ORGANIC CHEMISTRY, *PHOTOCHEMICAL
REACTIONS, *PHYSICAL PROPERTIES, ELECTROMAGNETIC
RADIATION, KINETICS, MAGNETIC FIELDS, MOLECULES,

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DTIC REPORT BIBLIOGRAPHY

AD-A221 107   20/4

HIGH TECHNOLOGY CORP HAMPTON VA

(U) Nonlinear Development of Gortler and Crossflow
    Vortices and Gortler/Tollmien-Schlichting Wave
    Interaction.

DESCRIPTIVE NOTE: Final rept. 1 Jul-31 Dec 89,

FEB 90   70P

PERSONAL AUTHORS: Malik, M. R.; Godil, A. ん.

REPORT NO.   HTC-9001

CONTRACT NO.   F49620-89-C-0093

PROJECT NO.   2307

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0388

UNCLASSIFIED REPORT

ABSTRACT: (U)   The problem of nonlinear development of
Goertler vortices on a curved wall is studied within the
framework of incompressible Navier-Stokes equations which
are solved by a Fourier-Chebyshev spectral method. The
results show that higher harmonics grow due to nonlinear
effects; however, most of the energy remains in the
fundamental mode. The computed flow field in the presence
of a Goertler vortex is in qualitative agreement with the
experimental data. The interaction of the Goertler vortex
with a two-dimensional Tollmien-Schlichting wave is also
studied and it is shown that the Tollmien-Schlichting
wave grows faster than its linear theory growth rate when
the amplitude of the Goertler vortex is sufficiently
large. Due to nonlinear effects this interaction further
leads to the development of oblique waves with spanwise
wavelength equal to the Goertler vortex wavelength. The
numerical method is also applied to study the nonlinear
development of a stationary crossflow vortex in a Falkner-
Skan-Cooke boundary layer. The crossflow vortex develops
in a manner similar to that found earlier for rotating
disk flow. The fundamental and the higher harmonics all
tend to saturate when the integration is carried to large
amplitudes. The computed velocity distribution clearly

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shows the emergence of the superharmonic which, however,
does not dominate the fundamental mode. The Falkner-Skan-
Cooke flow, modulated by the presence of the crossflow
vortex, is found to be subject to a new secondary
instability with large growth rates. (JHD)

DESCRIPTORS: (U)   *CROSS FLOW, *VORTICES, CURVATURE,
DISTRIBUTION, EXPERIMENTAL DATA, FLOW FIELDS, HARMONICS,
INCOMPRESSIBLE FLOW, LINEARITY, NAVIER STOKES EQUATIONS,
NONLINEAR SYSTEMS, NUMERICAL METHODS AND PROCEDURES,
ROTATION, STABILITY, STATIONARY, THEORY, VELOCITY, WALLS.
WAVES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2307A2, *Goertler
Vortices, Falkner Skan Cooke Boundary Layer, Fourier
Chebyshev Spectral Methods, Tollmien Schlichting Waves.

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AD-A221 102   21/2

AD-A221 102   CONTINUED

CALIFORNIA UNIV IRVINE

(U) Two-Dimensional Modeling of Flame Propagation in Fuel
     Stream Arrangements,

     88   25P

PERSONAL AUTHORS: Rangel, Roger H.; Sirignano, William A.

CONTRACT NO.   AFOSR-86-0016

PROJECT NO.   2308

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0392

            UNCLASSIFIED REPORT

ACCELERATION, CHEMICAL REACTIONS, COMBUSTION, COMBUSTORS,
DENSITY, DROPS, FLAMES, FLOW FIELDS, FUEL AIR RATIO, FUEL
SPRAYS, GAS FLOW, GEOMETRY, HETEROGENEITY, IGNITION,
INLETS, INTERACTIONS, LIQUEFIED GASES, MODELS, PARALLEL
ORIENTATION, PARTS, REPRINTS, RESPONSE, SHEETS,
SIMPLIFICATION, SPRAYS, THERMAL EXPANSION, TWO
DIMENSIONAL, TWO DIMENSIONAL FLOW, WALLS.

IDENTIFIERS: (U) WUAFOSR2308A2, PE61102F.

SUPPLEMENTARY NOTE: Pub. in Dynamics of Reactive Systems.
Part 2. Heterogeneous Combustion and Applications, v113
p128-150 1988.

ABSTRACT: (U)   In an effort to provide a useful
simplified model of flame initiation and propagation in a
spray arrangement consisting of several droplet streams
injected in a gas flow, this work analyzes a two-
dimensional heterogeneous flow between parallel walls in
which the droplet streams are represented by parallel
droplet sheets of specified inlet droplet number density
and velocity. Thermal expansion of the gas flow is partly
considered by allowing for the streamwise acceleration of
the gas as the heat released by the chemical reaction
increases the gas-phase temperature. The results indicate
that ignition is dependent on local conditions only,
although the overall efficiency of the reaction process
may be a function of the general geometry of the system.
A number of distinct reaction zones are shown to exist in
different parts of the flowfield, indicating that the
assumption of a unique flame front propagating throughout
the mixture may be too simplistic. Premixed-type flames
and diffusion-type flames are generally observed and
various levels of interaction between them are possible.
Spray combustion, Fllame propagation, Reprints, Fuel
sprays, Combustors, Fuel air ratio, Liquefied gases. (jg)

DESCRIPTORS: (U)   *FLAME PROPAGATION, *FUELS, *STREAMS,

AD-A221 102

AD-A221 077   9/4   20/3   AD-A221 077   CONTINUED

WISCONSIN UNIV-MILWAUKEE DEPT OF PHYSICS   IDENTIFIERS: (U)   PE61102F, WUAFOSR2306C1.

(U) Surface Wave Characterization of High Tc
     Superconductors.

DESCRIPTIVE NOTE: Final rept. 30 Sep 84-30 Sep 89.

MAR 90   20P

CONTRACT NO.   AFOSR-84-0350

PROJECT NO.   2306

TASK NO.   C1

MONITOR: AFOSR
           TR-90-0481

UNCLASSIFIED REPORT

ABSTRACT: (U)   High Tc superconducting controlling
elements for frequency tunable surface acoustic wave SAW
filters and dispersion lines in the 0.5 to 4 GHz range
have been proposed and designed. Ultrasonic attenuation
and velocity measurements in sinter forged YBa2Cu3O7
indicate that the sound waves are interacting with
excitations which are confined to the CuO planes.
Proximity SAW coupling to a two-dimensional electron gas
2 DEG has placed limits on the localization lengths of
the 2 DEG. A new phase transition has been ultrasonically
discovered in the mixed state of the heavy Fermion
superconductor UPt3. An anomalous increase in attenuation
in the superconducting state of the reentrant
superconductor system Er(1-x)Ho(x)Rh(4)B4 implies a novel
interaction mechanism in this system. SAW measurements on
granular superconducting films demonstrate that SAW
measure the sheet resistivity of these films on a length
scale comparable to the SAW wavelength. Keywords:
Superconductors; Surface acoustic waves; Electron gas;
Heavy fermion superconductors; Reentrant superconductors;
Granular superconducting film. (Jhd)

DESCRIPTORS: (U)   *ACOUSTIC ATTENUATION, *SUPERCONDUCTORS,
*SURFACE ACOUSTIC WAVES, *ULTRASONICS, RADIATION
ATTENUATION, ELECTRON GAS, INTERACTIONS, LENGTH,
MEASUREMENT, PHASE TRANSFORMATIONS, RESISTANCE, SCALE,
SHEETS, SOUND WAVES.

AD-A221 077   AD-A221 077

AD-A221 076   20/2   7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) An Unusual Rearrangement in the Boron-Trifluoride-
     Promoted Reaction of Tetracyclo(8.3.0.0(4,11).0(5,9))
     undecane-2,7-dione Monoethylene Acetal with Ethyl
     Diazoacetate.

        89   5P

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante;
     Marchand, Alan P.; Vidyasagar, V.

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0498

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica vC45
p1770-1773, 1989.

ABSTRACT: (U)   The cage structure is composed of six
fused five-membered rings with three recognizable
norbornane moieties, a seven-membered heterocyclic ring
in a twist-chair conformation and an extended side chain.
The five-membered rings of the norbornane moieties are
twisted from the normal envelope conformation toward half-
chair. There is an intermolecular hydrogen bond involving
the disordered side chain. Molecular-mechanics
calculations estimate the angle and torsional strains to
be 163.1 and 121.4 kilojoule per mole. Keywords: X-ray
crystal structure determination; Cage compounds;
Substituted trishomocubane; Carbon compounds;
Crystallography; Boron trifluoride; Tetracyclo...undecane-
2,7-dione monoethylene acetal; Ethyl diazoacetate. (jg)

DESCRIPTORS: (U)   *BORON COMPOUNDS, *FLUORIDES, CARBON
COMPOUNDS, CHAINS, CLATHRATE COMPOUNDS, CONFORMITY,
CRYSTAL STRUCTURE, CRYSTALLOGRAPHY, DETERMINATION,
ENVELOPE(SPACE), HYDROGEN BONDS, MOLECULE MOLECULE
INTERACTIONS, ORDER DISORDER TRANSFORMATIONS, SIDES, X
RAYS.

AD-A221 076

AD-A221 052   7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) A Convenient Synthesis of 1,7-Dibromo- and 1,7-
     Dichloro-Pentacyclo(5.4.0.0 2,6.0 3,10 .0 5,9)
     Undecane-8, 11-Diones,

        89   10P

PERSONAL AUTHORS: Marchand, Alan P.; Annapurna, Pendri

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
            TR-90-0497

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Synthetic Communications, v19
n20 p3477-3483 1989.

ABSTRACT: (U)   Endo-Tricyclo(6.2.1.0)undeca-4,9-diene-3,6-
dione reacts with X2-SMe2 (X = Bromine, Chlorine) to
afford the corresponding bis(alpha-haloenones) which then
can be photocyclized to afford the title compounds in 62%
and 30% overall yield, respectively. Keywords:
Triquinanes, Halogenation, Reprints. (KT)

DESCRIPTORS: (U)   *HALOGENATION, *SYNTHESIS(CHEMISTRY),
CHLORINE, REPRINTS, CYCLIC COMPOUNDS.

IDENTIFIERS: (U)   *Triquinanes.

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A221 051   12/7

LEHIGH UNIV BETHLEHEM PA DEPT OF MECHANICAL ENGINEERING AND MECHANICS

(U) Purchase of a Computer Superworkstation.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,

MAR 90   4P

PERSONAL AUTHORS: Walker, J. D.

CONTRACT NO.   AFOSR-89-0089

PROJECT NO.   3842

TASK NO.   A1

MONITOR: AFOSR
TR-90-0482

UNCLASSIFIED REPORT

ABSTRACT: (U)   After a six month evaluation period, in which workstations manufactured by Digital Equipment, Hewlett-Packard, Apollo Computer, Silicon Graphics, Ardent Computer and Stellor were evaluated, an Ardent Titan Superworkstation was purchased. This computer was configured with 64 MB of memory and two processors, both of which have vector-processing capability. The machine also permits sophisticated use of three-dimensional graphics. The Ardent computer was judged to have a better architecture than its competitors, to be more flexible in the method of adding peripherals and to have substantial price/performance advantages. The computer was delivered in July 1989 and is currently being used extensively for computational fluid mechanics research as well as imaging associated with the experimental programs. The purchase cost included new CPU boards which will automatically be installed when available. (kr)

DESCRIPTORS: (U)   *WORKPLACE LAYOUT, *COMPUTER ARCHITECTURE, COMPUTATIONS, COMPUTERS, COSTS, DIGITAL SYSTEMS, FLUID MECHANICS, GRAPHICS, LUNAR PROBES, MANNED SPACECRAFT, PROCUREMENT, SILICON, THREE DIMENSIUNAL, CENTRAL PROCESSING UNITS.

IDENTIFIERS: (U)   PE61104D, WUAFOSR3842A1, *Superworkstations.

AD-A221 051

AD-A221 050   20/4   21/2   21/4

JET PROPULSION LAB PASADENA CA

(U) The Modeling of Drop-Containing Turbulent Eddies.

DESCRIPTIVE NOTE: Final rept. 1 Oct 86-30 Sep 89.

NOV 89   235P

PERSONAL AUTHORS: Bellan, Josette

CONTRACT NO.   ISSA-87-0025

PROJECT NO.   2308

TASK NO.   A2

MONITOR: AFOSR
TR-90-0500

UNCLASSIFIED REPORT

ABSTRACT: (U)   Formulae are presented for spherical clusters of evaporating drops in axial flows and cylindrical clusters of evaporating drops in vortical flows. In both situations the formula is valid for dense and dilute clusters of drops. It is shown that evaporation of dense, spherical clusters of drops is substantially influenced by turbulence. Dense clusters of drops embedded in low turbulence surroundings initially contract due to evaporative cooling; modest expansion follows due to hot gas eventually entering the cluster. Dense clusters of drops embedded in high turbulence surroundings experience a short initial period of evaporative cooling which is followed by substantial cluster expansion. In contrast, the evaporation of dilute clusters of drops is not sensitive to turbulence; minimal cooling of the gas results in a minimal contraction with no expansion to follow. The evaporation time of the dense, cylindrical clusters of drops in vortical flows is mainly controlled by the initial solid body rotation of the drops. Evaporation time is a strong decreasing function of the air/fuel mass ratio in the dense cluster regime and asymptotically levels off in the dilute cluster regime. As the drops evaporate they move out radially forming a cylindrical shell around the center of the vortex. Both the final to initial volume ratio and the final to initial shell thickness ratio are decreasing functions of the initial air/fuel mass ratio. Dense fuel

AD-A221 050

AD-A221 050   CONTINUED

sprays. (edc)

DESCRIPTORS: (U)   *DROPS, *FUEL SPRAYS, *TURBULENCE, *VORTICES, CLUSTERING, COOLING, CYLINDRICAL BODIES, DILUTION, EVAPORATION, EXPANSION, AXIAL FLOW, FORMULAS(MATHEMATICS), FUEL AIR RATIO, GASES, HIGH DENSITY, HOT GASES, MASS, RATIOS, ROTATION, SENSITIVITY, SHELLS(STRUCTURAL FORMS), SPHERES, THICKNESS, TIME, VOLUME.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2308A2.

AD-A221 005   4/1   20/5

COLORADO UNIV AT BOULDER DEPT OF CHEMISTRY AND BIOCHEMISTRY

(U)   IR Transition Moments and Collisional Dynamics of Vibrationally Excited OH Radicals via Time-Resolved Laser Absorption Spectroscopy.

DESCRIPTIVE NOTE: Final rept. 1986-1989,

MAR 90   19P

PERSONAL AUTHORS: Nesbitt, David J.

CONTRACT NO.   F49620-86-C-0056

PROJECT NO.   2303

TASK NO.   B1

MONITOR: AFOSR
TR-90-0514

UNCLASSIFIED REPORT

ABSTRACT: (U)   A high resolution, IR laser flash kinetic spectrometer has been constructed for time-resolved study of reactive kinetics, energy transfer, and radiative properties of atmospheric OH radicals. Theoretical efforts predict a dramatic J dependence to OH vibrational radiative rates, which are exploited experimentally in the flash kinetic spectrometer to infer an empirical dipole moment function. The accuracy of this dipole moment function is extended to include the turning points of up to OH(v=9) by use of rotationally resolved emission from FTIR studies of the H + O3 chemiluminescent reaction. The explicit knowledge of the state-to-state radiative rates permits an absolute measurement of the quantum yields for 193 and 248 nm photolysis production of OH from HNO3 and H2O2. Reaction rates of OH with atmospheric hydrocarbons are investigated, as well as the relaxation processes of highly rotationally excited OH formed by excimer laser photolysis of HNO3. This information bears directly on the characterization of highly vibrationally and rotationally excited OH 'airglow' emission from the stratosphere. Keywords: OH radical; Flash kinetic spectroscopy; Infrared laser; Absorption; Dipole moment function. (jhd)

AD-A221 005

AD-A221 050

AD-A221 005   CONTINUED

DESCRIPTORS: (U)   *PHOTOCHEMICAL REACTIONS, *HYDROXYL
RADICALS, *AIRGLOW, ABSORPTION SPECTRA, ACCURACY,
PARTICLE COLLISIONS, DIPOLE MOMENTS, DYNAMICS, EMISSION,
ENERGY TRANSFER, EXCIMERS, FLASHES, HIGH RESOLUTION,
INFRARED LASERS, REACTION KINETICS, MEASUREMENT, MOMENTS,
PHOTOLYSIS, PRODUCTION, QUANTUM EFFICIENCY, REACTION TIME,
REACTIVITIES, RELAXATION, INFRARED SPECTROMETERS,
SPECTROSCOPY, STRATOSPHERE, TRANSITIONS, MOLECULAR
VIBRATION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B1.

AD-A220 996   13/8   20/12   9/3

COLUMBIA UNIV   NEW YORK MICROELECTRONICS SCIENCE LAB

(U)   Direct Writing of Microstructures for Solid-State
Electronics.

DESCRIPTIVE NOTE: Final rept. 15 Jun 86-14 Jun 89,

MAR 90   42P

PERSONAL AUTHORS: Osgood, Richard M.; Podlesnik, Dragan;
Scarmozzino, Rob

CONTRACT NO.   F49620-86-C-0067

PROJECT NO.   2301

TASK NO.   A1

MONITOR: AFOSR
TR-90-0512

UNCLASSIFIED REPORT

ABSTRACT: (U)   Progress in using laser chemical
processing for several applications in microelectronics
and integrated optics is described. These applications
are direct writing of metal interconnects on silicon
integrated circuits; laser doping, etching and surface
modification of GaAs, and fabrication of light guiding
components for integrated optics. Keywords: Laser
processing; Optical coupler; Diffraction grating; Laser;
GaAs; Si; Integrated circuits; Integrated circuits;
Aluminum metallization; Shallow doping; Waveguides.   (jhd)

DESCRIPTORS: (U)   *ETCHING, *INTEGRATED C RCUITS,
*MICROSTRUCTURE, *WRITING, ALUMINUM, COUPLERS, DOPING,
FABRICATION, GALLIUM ARSENIDES, GRATINGS(SPECTRA),
INTEGRATED SYSTEMS, LASER APPLICATIONS, PHOTOCHEMICAL
REACTIONS, METALLIZING, MICROELECTRONICS, MODIFICATION,
OPTICAL EQUIPMENT, OPTICS, PROCESSING, SHALLOW DEPTH,
SILICON, SOLID STATE ELECTRONICS, SURFACES, WAVEGUIDES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2301A1.

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A220 983   7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) Structure of an Open-Ended Cage Compound,

89   4P

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante;
Marchand, Alan P.; Reddy, G. M.

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0489

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, vC45
p1600-1602 1989.

ABSTRACT: (U)   11-Oxo-8-propionyloxypentacycloundecane-9-
carboxylic acid is composed of a nonbornane moiety (two
fused five-membered rings) fused along each side to five-
membered rings which are joined to form a four-membered
ring. The molecule is a cage with one side open. The two
C atoms of the open end contain a ketone moiety and a
planar endo-ester side chain. One end of the nonbornane
moiety, 1.573 (3) angstroms, is significantly longer than
all other bonds in the structure. The four-membered ring
has distances ranging from 1.542 (3) to 1.557 (3)
angstroms and is planar, r.m.s.d.=0.002 angstroms. The
two C atoms at the open end of the cage are separated by
2.665 (3) angstroms with the carbonyl C atom slightly
pyramidalized and lying out of the plane of the other
three atoms by 0.051 (3) angstroms. A hydrogen bond is
formed between the acid group of one molecule and the
keto of an adjacent molecule. Reprints. (jes)

DESCRIPTORS: (U)   *HYDROGEN BONDS, *ORGANIC MATERIALS,
ACIDS, ATOMS, MOLECULES, REPRINTS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2.

AD-A220 983

AD-A220 982   7/4   7/3

NORTH TEXAS STATE UNIV DENTON DEPT OF CHEMISTRY

(U) Structure of a Tetracyclic Diketone,

90   4P

PERSONAL AUTHORS: Watson, William H.; Nagl, Ante;
Marchand, Alan P.; Vidyasagar, V.

CONTRACT NO.   AFOSR-88-0132

PROJECT NO.   2303

TASK NO.   B2

MONITOR: AFOSR
TR-90-0495

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Acta Crystallographica, vC46
p152-154 1990.

ABSTRACT: (U)   The X-ray crystal structure of ethyl 3,12-
dioxotetracyclo(6.4.0.0(2,6).0(5,9)-dodec-10-ene-11-
carboxylate, C(15)H(16)O(4), is reported. Keywords: X-ray
crystal structure determination, Reprints, Esters, Cage
compound, Ketones, Norbornane moiety, Cyclohexenone ring.
(JG)

DESCRIPTORS: (U)   *CRYSTAL STRUCTURE, *KETONES,
CYCLOHEXENES, DETERMINATION, ESTERS, REPRINTS, RINGS, X
RAYS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303B2, Cage compound.

AD-A220 982

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A220 871   20/6   20/6.1   AD-A220 871   CONTINUED

OPTICAL SOCIETY OF AMERICA WASHINGTON DC   IDENTIFIERS: (U)   Second Harmonic Generation.

(U) Nonlinear Guided-Wave Phenomena: Physics and
    Applications. 1989 Technical Digest Series. Volume 2.
    Conference Edition.

DESCRIPTIVE NOTE: Final rept. 1 Apr 89-25 Jan 90.

JAN 90   319P

CONTRACT NO.   N00014-89-J-1803, AFOSR-89-0266

MONITOR: AFOSR
            TR-90-0418

            UNCLASSIFIED REPORT

Availability: Optical Society of America, 1816 Jefferson
Place, N.W., Washington, DC 20036. PC $82.00. No copies
furnished by DTIC/NTIS.

SUPPLEMENTARY NOTE: Summaries of papers presented at
Topical Meeting Held in Houston, Texas on 2-4 February
1989.

ABSTRACT: (U)   The symposia covered all aspects of
nonlinear optics in guided wave geometries and to define
the current state of the art. It spanned the range from
fabrication to theory in both fiber and planar structures.
Future application of guided-wave nonlinearities requires
improvement in fundamental understanding of the basic
effects as well as better materials and structures. Thus,
the emphasis fo the present meeting was on physical
phenomena and device concepts. Contents: Parametric
mixing and second harmonic generation in planar guides;
Optical fiber communications and poster previews; All
optical switching; Solitons and pulse compression;
Soliton laser effects; Nonlinear organics; Nonlinear wave
propagation; Fundamental effects; and Second harmonic
generation in fibers. (JHD)

DESCRIPTORS: (U)   *FIBER OPTICS, *SOLITONS, *OPTICAL
WAVEGUIDES, FABRICATION, HARMONIC GENERATORS, MIXING,
NONLINEAR PROPAGATION ANALYSIS, NONLINEAR SYSTEMS,
OPTICAL COMMUNICATIONS, OPTICAL SWITCHING, ORGANIC
MATERIALS, PARAMETRIC ANALYSIS, STATE OF THE ART, PLANAR
STRUCTURES, PULSE COMPRESSION, SYMPOSIA, WAVE PROPAGATION.

AD-A220 871

AD-A220 460   20/12   14/2

STEVENS INST OF TECH HOBOKEN NJ PLASMA AND SURFACE
PHYSICS LAB

(U) Surface Physics Instrumentation.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,

JAN 90   25P

PERSONAL AUTHORS: Seidl, Milos; Isenberg, Joshua; Kim,
Seong I.; Souzis, Andrew E.

CONTRACT NO.   AFOSR-89-0195

PROJECT NO.   3842

TASK NO.   A6

MONITOR: AFOSR
           TR-90-0340

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report describes the considerable
improvements in surface physics instrumentation at the
Plasma and Surface Physics Laboratory made possible grant.
The following three add-on instruments were purchased:
Scanning Tunneling Microscope (STM), Low Energy Electron
Diffractometer (LEED), Quadrupole Mass Spectrometer (QMS).
A unique design has been chosen for STM. Starting with a
non-vacuum STM (Nanoscope II), a vacuum compatible STM
head was designed. The head uses the Nanoscope computer
and can be attached to either of our UHV chambers. All
the acquired instruments have been integrated with the
two surface instrumentation systems existing in the
laboratory. The Surface Analysis System is equipped with
Auger Electron Spectroscopy (AES), Ultra Violet
Photoelectron Spectroscopy (UPS), Work Function Measuring
Station and Sample Transfer System for the STM. The Ion
Beam System is equipped with the Quadrupole Mass
Spectrometer Ion Mass Spectroscopy used for Spectroscopy,
LEED, two Ion Beam Lines and Sample Transfer System for
the STM. Keywords: Surface physics; Surface analysis;
Scanning tunneling microscope; Low energy electron
diffraction; Mass analysis. (JHD)

DESCRIPTORS: (U)   *ELECTRON DIFFRACTION, *MASS
SPECTROMETERS, *SCANNING ELECTRON MICROSCOPES, *SURFACE

AD-A220 460

ANALYSIS, AUGER ELECTRON SPECTROSCOPY, DIFFRACTOMETERS,
ELECTRON ENERGY, INSTRUMENTATION, ION BEAMS, LOW ENERGY,
MEASUREMENT, PHOTOELECTRON SPECTRA, PHYSICS LABORATORIES,
QUADRUPOLE MOMENT, SPECTROSCOPY, SURFACES, TRANSFER,
TUNNELING(ELECTRONICS), ULTRAVIOLET RADIATION, VACUUM,
WORK FUNCTIONS.

IDENTIFIERS: (U)   PE61102D, WUAFOSR3842A6.

AD-A220 355   6/4

DARTMOUTH MEDICAL SCHOOL HANOVER NH DEPT OF PSYCHIATRY

(U) DURIP - Improved Eye Movement Monitoring Capabilities
for Studies in Visual Cognition.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-31 Nov 89,

FEB 90   7P

PERSONAL AUTHORS: Fendrich, Robert

CONTRACT NO.   AFOSR-89-0191

PROJECT NO.   3842

TASK NO.   A4

MONITOR: AFOSR
TR-90-0362

UNCLASSIFIED REPORT

ABSTRACT: (U)   We have interfaced the new Image
eyetracker with a Hewlett-Packard 1310 large screen
display and IBM PC/AT computer. The IBM contains a Data-
Translation high speed D/A-A/D board and a vector drawing
board. Specialized software has been developed to analyze
the characteristics of both pursuit and saccadic eye
motions. The investigations described below are
representative subset of the studies we are conducting
with the eyetracker. Keywords: Vision oculomotor system;
Spatial attention; Illusions; Stroboscopic displays. (kt)

DESCRIPTORS: (U)   *EYE MOVEMENTS, *OPTICAL TRACKING,
ATTENTION, COGNITION, COMPUTER PROGRAMS, ENGINEERING
DRAWINGS, EYE, ILLUSIONS, IMAGES, MONITORING, MOTION,
OCULOMOTOR NERVE, PURSUIT COURSES, SPATIAL DISTRIBUTION,
VECTOR ANALYSIS, VISION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR3842A4, *Eyetracking.

AD-A220 357   12/9

CIMFLEX TEKNOWLEDGE CORP PALO ALTO CA

(U) Intelligent Real-Time Problem Solving.

DESCRIPTIVE NOTE: Final rept. 15 Sep-14 Dec 89,

JAN 90   190P

PERSONAL AUTHORS: Lark, Jay

CONTRACT NO.   F49620-89-C-0129

PROJECT NO.   5581

TASK NO.   A7

MONITOR: AFOSR
TR-90-0323

UNCLASSIFIED REPORT

ABSTRACT: (U)   A workshop on Intelligent Real-Time
Problem Solving (IR TPS) was held in Santa Cruz,
California, November 6 and 7, 1989. The workshop was
sponsored by AFOSR (Air Force Office of Scientific
Research), RADC (AF Rome Air Development Center), and
WRDC (AF Wright Research and Development Center) as part
of an initiative to stimulate the development of a
national basic research focus on IRTPS. This report
summarizes the results of that workshop and the work
leading up to it. Keywords: Artificial intelligence;
State of the Art. (kt)

DESCRIPTORS: (U)   *ARTIFICIAL INTELLIGENCE, *PROBLEM
SOLVING, CALIFORNIA, REAL TIME.

IDENTIFIERS: (U)   PE62707F, WUAFOSR5581A7.

AD-A220 273   15/5   12/3

AD-A220 273   CONTINUED

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

SIMULATION, SURVIVAL(GENERAL).

(U) Nonparametric Inference under Minimal Repair.

IDENTIFIERS: (U)   Wilcoxon two sample test.

DESCRIPTIVE NOTE: Technical rept.,

FEB 90   11P

PERSONAL AUTHORS: Hollander, Myles; Presnell, Brett;
Sethuraman, Jayaram

REPORT NO.   FSU-TR-M-818, USARO-TR-D-111

CONTRACT NO.   DAAL03-86-K-0094, $AFOSR-88-0040

MONITOR: ARO, AFOSR
23699.28-MA, TR-90-0395

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Also available as rept. no. AFOSR-TR-
90-245

ABSTRACT: (U)   In the age-dependent minimal repair model
of Block, Borges, and Savits (1985), a system failing at
age t undergoes one of two types of repair. With
probability p(t), a perfect repair is performed, and the
system is returned to the good-as-new state, while with
probability 1 - p(t), a minimal repair is performed, and
the system is repaired, but is only as good as a working
system of age t. Whitaker and Samaniego (1989) propose an
estimator for the system life distribution F when data
are collected under this model. Using the product
integral representation of the survival function, a basic
result of Block, Borges, and Savits concerning the
waiting time until the first perfect repair is extended
to allow for discontinuous distributions. Then using
counting process techniques, the large sample theorems of
Whitaker and Samaniego are extended to the whole line.
These results are used to derive confidence bands for F,
and to determine a sufficient condition for their
applicability on the whole line. Simulation results for
the bands are provided. An extension of the Wilcoxon two-
sample test to the minimal repair model is also examined.
(JHD)

DESCRIPTORS: (U)   *STATISTICAL FUNCTIONS, *REPAIR,
COUNTING METHODS, INTEGRALS, MATHEMATICAL MODELS,

AD-A220 273

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A220 184   12/4   AD-A220 184   CONTINUED

CONNECTICUT UNIV STORRS DEPT OF ELECTRICAL AND SYSTEMS   IDENTIFIERS: (U)   PE61102F.
ENGINEERING

(U) Control of Discrete Time Hybrid Stochastic Systems,

    89   7P

PERSONAL AUTHORS: Campo, L.; Bar-Shalom, Y.

CONTRACT NO.   AFOSR-88-0202

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
            TR-90-0336

            UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of American
Control Conference, 1989.

ABSTRACT: (U)   A realistic stochastic control problem for
hybrid systems with Markovian jump parameters can have
the switching parameters in both the state and
measurement equations. Furthermore, both the system state
and the jump states are, in general, not perfectly
observed. Currently there are only two existing
controllers for this problem. One is based upon a
heuristic multiple model partitioning (MMP) and
hypothesis pruning. The other utilizes the entire future
tree of models, and is called the Full-Tree (FT)
controller. The performance of the latter is
significantly superior to the former and their
complexities are similar. This paper presents a new
stochastic control algorithm for stochastic systems with
Markovian jump parameters. This control algorithm is
derived through the use of stochastic dynamic programming
and is designed to be used for realistic control problems,
i.e., with noisy state observations. (KR)

DESCRIPTORS: (U)   *HYBRID SYSTEMS, *STOCHASTIC CONTROL,
ALGORITHMS, CONTROL, DYNAMIC PROGRAMMING, EQUATIONS,
HEURISTIC METHODS, HYPOTHESES, MARKOV PROCESSES,
MATHEMATICAL PROGRAMMING, MEASUREMENT, MODELS, PARAMETERS,
STOCHASTIC PROCESSES, SWITCHING, TREES.

AD-A220 184   AD-A220 184

AD-A220 134   13/13   12/2

CALIFORNIA UNIV LOS ANGELES DEPT OF ELECTRICAL
ENGINEERING

(U) Damping Operators in Continuum Models of Flexible
Structures: Explicit Models for Proportional Damping
in Beam Torsion,

MAR 90   17P

PERSONAL AUTHORS: Balakrishnan, A. V.

CONTRACT NO.   AFOSR-88-0252

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
TR-90-0305

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Differential and Integral
Equations, v3 n2 p381-396 Mar 90.

ABSTRACT: (U)   A new, explicit representation of damping
operators for strictly proportional damping for the
torsion mode of a finite beam is presented. The damping
operator is the square root of the stiffness operator
(enhanced to include the boundary) and is calculated
using the Balakrishnan formula. It is nonlocal, and for
the clamped (or fixed) end case, turns out to be a
finite-limit version of the Hilbert transform: with end
mass (or boundary control), the square-root operator
introduces nonlocal terms on the boundary as well.
Keywords: Damping; Flexible structures; Torsion;
Beams(Structural); AMS Subject classifications: 35M05,
76A10; Reprints; Structural engineering; American
mathematical society. (JG)

DESCRIPTORS: (U)   *DAMPING, *FLEXIBLE STRUCTURES,
*TORSION, BOUNDARIES, CLASSIFICATION, CONTROL, MASS,
MODELS, REPRINTS, SQUARE ROOTS, STIFFNESS, STRUCTURAL
ENGINEERING.

IDENTIFIERS: (U)   WUAFOSR2304A1, PE61102F.

AD-A220 134

AD-A220 108   7/2

MICHIGAN UNIV ANN ARBOR DEPT OF MATERIALS SCIENCE AND
ENGINEERING

(U) International Conference on the Science and Technology
of Zirconia (ZrO2IV) (4th) Held in Anaheim, California
on Nov 1-3, 1989.

DESCRIPTIVE NOTE: Final rept 1989-1990,

FEB 90   39P

PERSONAL AUTHORS: Chen, I-Wei

CONTRACT NO.   AFOSR-89-0366

PROJECT NO.   2306

TASK NO.   A2

MONITOR: AFOSR
TR-90-0350

UNCLASSIFIED REPORT

ABSTRACT: (U)   The Fourth International Conference on the
Science and Technology of Zirconia (ZrO2 IV) was held at
Anaheim, California in November, 1989. One hundred twenty
(120) papers were presented on topics covering fuel cells,
phase transformation, processing, sensors, defects,
fracture, fatigue, creep, and superplasticity. Trends in
zirconia research are summarized. It is suggested that
zirconia has begun to attain the status of 'classical'
ceramics, like Al2O3 and UO2, and will continue to offer
current and future scientific research opportunities.
Keywords: Zirconia; Fuel cell; Phase transformation;
Sensors: Processing; Toughening; Fracture; Fatigue;
Superplasticity; Microstructure; Conferences; Symposia.
(kt)

DESCRIPTORS: (U)   *MICROSTRUCTURE, *SYMPOSIA, *ZIRCONIUM
OXIDES, CALIFORNIA, CERAMIC MATERIALS, CREEP, DETECTORS,
FUEL CELLS INTERNATIONAL, PHASE TRANSFORMATIONS,
SUPERPLASTICITY.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2306A2, Conferences.
*Zirconia.

AD-A220 108

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A220 052   9/5

AD-A220 052   CONTINUED

NEW MEXICO UNIV ALBUQUERQUE CENTER FOR HIGH TECHNOLOGY
MATERIALS

POWER, MATERIALS, NONLINEAR SYSTEMS, SEMICONDUCTOR LASERS,
SPECTRAL LINES, STATICS, THIN FILMS.

(U) Optoelectronics Research Center.

IDENTIFIERS: (U)   PE61103D, WUAFOSR623151.

DESCRIPTIVE NOTE: Final rept. 1 Oct 86-30 Nov 87,

OCT 88   9P

PERSONAL AUTHORS: Brueck, S. R.

CONTRACT NO.   F49620-87-C-0008

PROJECT NO.   6231

TASK NO.   51

MONITOR: AFOSR
TR-88-1223

UNCLASSIFIED REPORT

ABSTRACT: (U)   This year has been characterized by major
upgrades in facilities and equipment. In December of 1986,
the first laboratories were moved into the new Electrical
and Computer Engineering building. Laboratories
associated with the Optoelectronics Research Center that
are now operational in this new building include: the
Class-100 cleanroom; two optoelectronics device physics
laboratories - one devoted to relatively low power
devices with experiments in nonlinear dynamics, static
properties of multi-mirror cavities, narrow linewidth
diode lasers, etc. and a second devoted to
characterization of devices fabricated at the Center for
High Technology Materials, and to high-power devices; a
laser-materials interaction laboratory; laboratories for
rf-sputtering of PLZT thin films; ion-assisted deposition
of thin-films; materials characterization, bonding, e-
beam evaporation; SEM facilities. Laboratories for ion-
speed uv-detectors, not funded as part of this program,
beam figuring and heterodyne characterization of high-
have also been located in this facility. Optoelectronics,
Nonlinear dynamics, Ion-beam, High-speed uv-detectors.
(eg)

DESCRIPTORS: (U)   *ELECTROOPTICS, *RESEARCH FACILITIES,
DEPOSITION, DYNAMICS, ELECTRON BEAMS, EVAPORATION, HIGH
POWER, INTERACTIONS, IONS, LABORATORIES, LASERS, LOW

AD-A220 052

AD-A220 052

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A220 042   20/6

STATE UNIV OF NEW YORK AT BUFFALO DEPT OF CHEMISTRY

(U) Dynamics of Resonant Third-Order Optical Nonlinearity
     in Perylene Tetracarboxylic Dianhydride Studied by
     Monitoring First-and Second-Order Diffractions in
     Subpicosecond Degenerate Four-Wave Mixing,

     DEC 89   8P

PERSONAL AUTHORS: Samoc, Marek; Prasad, Paras N.

CONTRACT NO.   F49620-87-C-0042

PROJECT NO.   2303

TASK NO.   A3

MONITOR: AFOSR
            TR-90-0010

            UNCLASSIFIED REPORT

ABSTRACT: (U)   We present a novel approach using
simultaneous monitoring of temporal behavior of the usual
phase conjugated signal and the second-order diffraction
produced in a degenerate four-wave mixing experiment to
obtain information about dynamics of resonant third-order
nonlinear optical processes. The second-order diffraction
is interpreted as arising from the presence of the
appropriate Fourier component of the excited state
grating. The higher Fourier components are expected to be
generated in the presence of such excited state processes
as bimolecular decay, two-photon absorption, saturation
of absorption and diffusion of excitation. Third-order
nonlinear optical properties of an organic dye: perylene
tetracaboxylic dianhydride were studied by this approach
using subpicosecond degenerate four-wave mixing at a
wavelength of 602nm. The dye is found to exhibit a strong
resonant nonlinear effect with an effective x(3) of
approx. 2 x 10 (to the minus 10) esu. The decay of the
phase conjugated signal is power dependent and can be
theoretically simulated by using a combination of
monomolecular and bimolecular decay laws. The temporal
behavior of the phase conjugated signal and the second-
order diffraction are investigated at different

AD-A220 042

AD-A220 042   CONTINUED

intensities. The observed characteristics are well
simulated by using a dominant bimolecular decay mechanism
at higher excitation density. Reprints. (KT)

DESCRIPTORS: (U)   *NUCLEAR RESONANCE, *ANHYDRIDES,
*CARBOXYL GROUPS, *NONLINEAR SYSTEMS, *OPTICAL PROPERTIES,
ABSORPTION, DECAY, DENSITY, DIFFUSION, DYES, DYNAMICS,
EXCITATION, FOURIER ANALYSIS, GRATINGS(SPECTRA),
MOLECULES, MONITORING, ORGANIC COMPOUNDS, REPRINTS,
RESONANCE, SATURATION, SIGNALS, SYNCHRONISM, TWO PHOTON
ABSORPTION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2303A3, *Anhydride(d1)/
Tetracarboxylic, *Tetracarboxylic dianhydride.

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A220 004   CONTINUED

IDENTIFIERS: (U) PE61102F, WUGL2310G903.

AD-A220 004   4/1

GEOPHYSICS LAB (AFSC) HANSCOM AFB MA

(U) An Analytic/Empirical Model of the Middle and Low
    Latitude Ionosphere.

DESCRIPTIVE NOTE: Interim scientific rept..

MAR 89   54P

PERSONAL AUTHORS: Forbes, J. M.; Anderson, D. N.;
    Codrescu, M.; Batista, P. P.

REPORT NO.   GL-TR-89-0096, ERP-1027

CONTRACT NO.   AFOSR-85-0048

PROJECT NO.   2310

TASK NO.   G9

MONITOR: AFOSR
            TR-90-0617

UNCLASSIFIED REPORT

ABSTRACT: (U)   An improved analytic/empirical model of F-
layer plasma density is developed by modifying the Chiu
(1975) model so as to: (a) better approximate middle
latitude F-layer peak heights (hmF2's) as derived from
ionosonde data, and (b) better model features such as the
post-sunset rise in the F-layer peak height, and the
equatorial anomaly maxima in plasma density near + or -
15 geomagnetic latitude. The latter is accomplished by
applying analytic low-latitude correction as derived from
differences between the Chiu model and the SLIM model of
Anderson et al. Results of a numerical model are also
presented that demonstrate the importance of these low-
latitude plasma structures tot he neutral dynamics of the
thermosphere. Keywords: Electron densities; Ionospheric
model; Ionosphere neutral atmosphere coupling. (JHD)

DESCRIPTORS: (U)   *ELECTRON DENSITY, *F REGION,
*PLASMAS(PHYSICS), ANOMALIES, ATMOSPHERES,
COUPLING(INTERACTION), ION DENSITY, DYNAMICS, EQUATORIAL
REGIONS, HEIGHT, IONOSONDES, IONOSPHERE, IONOSPHERIC
MODELS, LATITUDE, MATHEMATICAL MODELS, NEUTRAL, PEAK
VALUES, THERMOSPHERE.

AD-A220 004

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 964   6/4   6/1   AD-A219 959   5/1

ZURICH UNIV (SWITZERLAND)   UNIVERSAL ENERGY SYSTEMS INC   DAYTON OH

(U) Neurotransmitter and Peptide Localization in Human   (U) United States Air Force Faculty Research Program 1989.
    Brain.   Program Technical Report. Volume 4.

DESCRIPTIVE NOTE: Final rept. 1 May 86-30 Apr 89.   DESCRIPTIVE NOTE: Annual rept.,

  MAR 90   6P   DEC 89   765P

PERSONAL AUTHORS: Chan-Palay, Victoria   PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.

CONTRACT NO.   AFOSR-86-0176   CONTRACT NO.   F49620-85-C-0013

PROJECT NO.   2312   PROJECT NO.   3396

TASK NO.   A2   TASK NO.   D5

MONITOR: AFOSR   MONITOR: AFOSR
           TR-90-0358   TR-90-0369-VOL-4

        UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

ABSTRACT: (U)   Studies utilizing human brain tissue   SUPPLEMENTARY NOTE: See also Volume 1, AD-A219 956.
examined the colocalozation of neurotransmitters using
immunocytochemical and in vitro hybridization techniques. ABSTRACT: (U)   The United States Air Force Summer Faculty
Results have shown the coexistance of somatostatin and   Research Program (USAF-SFRP) is designed to introduce
neuropeptide Y in the hippocampus, and galanin and   university, college, and technical institute faculty
acetylcholine in the human forebrain. Keywords: members to Air Force research. This is accomplished by
Biochemistry; Neurotransmitters. (KT)   the faculty members being selected on a nationally
                                                           advertised competitive basis for a ten-week assignment
                                                           during the summer intersession period to perform research
                                                           at Air Force laboratories/centers. Each assignment is in
DESCRIPTORS: (U)   *BRAIN, *NEUROCHEMISTRY, *NEUROMUSCULAR   a subject area and at an Air Force facility mutually
TRANSMISSION, *PEPTIDES, ACETYLCHOLINE, BIOCHEMISTRY,   agreed upon by the faculty members and the Air Force. In
HIPPOCAMPUS, HUMANS, HYBRIDIZATION, IN VITRO ANALYSIS,   addition to compensation, travel and cost of living
TISSUES(BIOLOGY).   allowances are also paid. The USAF-SFRP is sponsored by
                                                           the Air Force Office of Scientific Research, Air Force
IDENTIFIERS: (U)   PE61102F, WUAFOSR2312A2, *Neuromuscular   Systems Command, United States Air Force, and is
transmitters, *Neurotransmitters.   conducted by Universal Energy Systems, Inc. The specific
                                                           objectives of the 1989 USAF-SFRP are: 1) To provide a
                                                           productive means for U.S. faculty members to participate
                                                           in research at Air Force Laboratories/Centers; 2) To
                                                           stimulate continuing professional association among the
                                                           faculty and their professional peers in the Air Force; 3)
                                                           To further the research objectives of the United States
                                                           Air Force; and 4) To enhance the research productivity
                                                           and capabilities of the faculty especially as these
                                                           relate to Air Force technical interests. Keywords:

AD-A219 964   AD-A219 959

AD-A219 958   5/1

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Summer Faculty Research
    Program 1989. Program Technical Report. Volume 3.

DESCRIPTIVE NOTE: Annual rept.,

DEC 89   604P

PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.

CONTRACT NO.   F49620-85-C-0013

PROJECT NO.   3396

TASK NO.   D5

MONITOR: AFOSR
            TR-90-0368-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-A219 959.

ABSTRACT: (U)   The United States Air Force Summer Faculty
Research Program (USAF-SFRP) is designed to introduce
university, college, and technical institute faculty
members to Air Force research. This is accomplished by
the faculty members being selected on a nationally
advertised competitive basis for a ten-week assignment
during the summer intersession period to perform research
at Air Force laboratories/centers. Each assignment is in
a subject area and at an Air Force facility mutually
agreed upon by the faculty members and the Air Force. In
addition to compensation, travel and cost of living
allowances are also paid. The USAF-SFRP is sponsored by
the Air Force Office of Scientific Research, Air Force
Systems Command, United States Air Force, and is
conducted by Universal Energy Systems, Inc. The specific
objectives of the 1989 USAF-SFRP are: 1) To provide a
productive means for U.S. faculty members to participate
in research at Air Force Laboratories/Centers; 2) To
stimulate continuing professional association among the
faculty and their professional peers in the Air Force; 3)
To further the research objectives of the United States
Air Force; and 4) To enhance the research productivity
and capabilities of the faculty especially as these
relate to Air Force technical interests. Keywords:

AD-A219 958

AD-A219 959   CONTINUED

Reports, Abstracts. (kr)

DESCRIPTORS: (U) *AIR FORCE RESEARCH, *RESEARCH
MANAGEMENT, ADDITION, AIR FORCE, AIR FORCE FACILITIES,
AIR FORCE SYSTEMS COMMAND, COMPENSATION, COSTS,
INSTRUCTORS, LABORATORIES, PRODUCTIVITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR3396D5.

AD-A219 959

DTIC REPORT BIBLIOGRAPHY

AD-A219 958   CONTINUED

Reports, Abstracts. (kr)

DESCRIPTORS: (U)   *AIR FORCE RESEARCH, *RESEARCH
MANAGEMENT, AIR FORCE, AIR FORCE FACILITIES, AIR FORCE
SYSTEMS COMMAND, COMPENSATION, COSTS, INSTRUCTORS,
LABORATORIES, PRODUCTIVITY.

IDENTIFIERS: (U)   PE61102F, WUAFOSR3396D5.

AD-A219 957   5/1

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Summer Faculty Research
     Program 1989. Program Technical Report. Volume 2.

DESCRIPTIVE NOTE: Annual rept..

DEC 89   779P

PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.

CONTRACT NO.   F49620-85-C-0013

PROJECT NO.   3396

TASK NO.   D5

MONITOR: AFOSR
           TR-90-0367-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A219 958.

ABSTRACT: (U)   The United States Air Force Summer Faculty
Research Program (USAF-SFRP) is designed to introduce
university, college, and technical institute faculty
members to Air Force research. This is accomplished by
the faculty members being selected on a nationally
advertised competitive basis for a ten-week assignment
during the summer intersession period to perform research
at Air Force laboratories/centers. Each assignment is in
a subject area and at an Air Force facility mutually
agreed upon by the faculty members and the Air Force. In
addition to compensation, travel and cost of living
allowances are also paid. The USAF-SFRP is sponsored by
the Air Force Office of Scientific Research, Air Force
Systems Command, United States Air Force, and is
conducted by Universal Energy Systems, Inc. The specific
objectives of the 1989 USAF-SFRP are: 1) To provide a
productive means for U.S. faculty members to participate
in research at Air Force Laboratories/Centers; 2) To
stimulate continuing professional association among the
faculty and their professional peers in the Air Force; 3)
To further the research objectives of the United States
Air Force; and 4) To enhance the research productivity
and capabilities of the faculty especially as these
relate to Air Force technical interests. Keywords:

AD-A219 957

AD-A219 958

AD-A219 957   CONTINUED

Reports, Abstracts. (kr)

DESCRIPTORS: (U)   *RESEARCH MANAGEMENT, *AIR FORCE
RESEARCH, AIR FORCE, AIR FORCE FACILITIES, AIR FORCE
SYSTEMS COMMAND, COMPENSATION, COSTS, INSTRUCTORS,
LABORATORIES, PRODUCTIVITY.

IDENTIFIERS: (U)   PE61102F, WUAFOSR3396D5.

AD-A219 956   5/1

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Summer Faculty Research
     Program 1989. Program Technical Report. Volume 1.

DESCRIPTIVE NOTE: Annual rept.,

DEC 89   839P

PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.

CONTRACT NO.   F49620-85-C-0013

PROJECT NO.   3396

TASK NO.   D5

MONITOR: AFOSR
            TR-90-0366-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-A219 957.

ABSTRACT: (U)   The United States Air Force Summer Faculty
Research Program (USAF-SFRP) is designed to introduce
university, college, and technical institute faculty
members to Air Force research. This is accomplished by
the faculty members being selected on a nationally
advertised competitive basis for a ten-week assignment
during the summer intersession period to perform research
at Air Force laboratories/centers. Each assignment is in
a subject area and at an Air Force facility mutually
agreed upon by the faculty members and the Air Force. In
addition to compensation, travel and cost of living
allowances are also paid. The USAF-SFRP is sponsored by
the Air Force Office of Scientific Research, Air Force
Systems Command, United States Air Force, and is
conducted by Universal Energy Systems, Inc. The specific
objectives of the 1989 USAF-SFRP ARE: 1) To provide a
productive means for U.S. faculty members to participate
in research at Air Force Laboratories/Centers; 2) To
stimulate continuing professional association among the
faculty and their professional peers in the Air Force; 3)
To further the research objectives of the United States
Air Force; and 4) To enhance the research productivity
and capabilities of the faculty especially as these
relate to Air Force technical interests. Keywords:

AD-A219 956

AD-A219 956   CONTINUED

Reports, Abstracts. (kr)

DESCRIPTORS: (U) *RESEARCH MANAGEMENT, *AIR FORCE
RESEARCH, AIR FORCE, AIR FORCE FACILITIES, AIR FORCE
SYSTEMS COMMAND, COMPENSATION, COSTS, INSTRUCTORS,
LABORATORIES, PRODUCTIVITY.

IDENTIFIERS: (U) PE61102F, WUAFOSR3396D5.

AD-A219 942   12/6   12/5

PUERTO RICO UNIV MAYAQUEZ DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

(U) Communication System Simulation Workstation.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89.

JAN 90   33P

PERSONAL AUTHORS: Parsiani, Hamed; Cruz-Emeric, Jorge

CONTRACT NO.   AFOSR-89-0117

PROJECT NO.   3842

TASK NO.   A5

MONITOR: AFOSR
TR-90-0354

UNCLASSIFIED REPORT

ABSTRACT: (U)   The two VAX 3100 workstations and
softwares arrived by mid December and were installed in a
room designated as Advanced Communications Laboratory.
The full color Targa 24 board arrived in January 1990.
Both VAX operating systems have been loaded, and the BOSS
and SPW softwares will be loaded soon by the two paid
graduate students recently assigned to this lab. Their
priorities are learning the VMS operating system, and the
usage of the two software systems. An IBM compatible PC
with 640K RAM and 20 MB hard disk is assigned to this lab
in which the full color image board is installed.
Therefore, any full color image data processed by the VAX
workstations will be displayed by the full color board.
(kr)

DESCRIPTORS: (U) *DATA PROCESSING EQUIPMENT, *WORKPLACE
LAYOUT, *COMPUTER PROGRAMS, COMMUNICATION AND RADIO
SYSTEMS, DISKS, IMAGES, LABORATORIES, LEARNING,
SIMULATION, STATIONS, STUDENTS, WORK.

IDENTIFIERS: (U) PE61104D, WUAFORSR3842A5.

AD-A219 942

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 937   22/1   20/11   12/2   AD-A219 937   CONTINUED

TEXAS TECH UNIV LUBBOCK DEPT OF ELECTRICAL ENGINEERING

IDENTIFIERS: (U)   LSS(Large Space Structures), Harmonic decomposition, WUAFOSR2304A1, PE61102F.

(U) A Theory of Control for Infinite Dimensional Systems With Application to Large Scale Space Structures.

DESCRIPTIVE NOTE: Final rept. 15 Dec 87-14 Dec 89.

FEB 90   34P

PERSONAL AUTHORS: Emre, Erol

CONTRACT NO.   AFOSR-88-0078

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
           TR-90-0332

UNCLASSIFIED REPORT

ABSTRACT: (U)   An extended and unifying system identification technique for a class of systems that include all main signal models that arise in the Harmonic Decomposition Problem has been obtained. This technique unifies and extends the previously developed system identification techniques which are improvements on the PISARENKO (MUSIC, dually) Harmonic Decomposition as they arise in arrays of sensors. The advantages of the technique and some of its specializations given here include having no assumptions of stationarity on the stochastic processes involved. Another contribution on this technique is to show that it can also be used without any resort to probability theoretic concepts, thus bypassing the approximation of autocorrelations via time averages, yielding the system parameters exactly. This techniques can be utilized to determine the dominant modes of vibrations of flexible structures as well. An analogy is established between arrays of sensors for target signal returns and those that can be used for vibrations in flexible structures. (JHD)

DESCRIPTORS: (U)   *CONTROL THEORY, *FLEXIBLE STRUCTURES, *SPACECRAFT, *VIBRATION, ARRAYS, AUTOCORRELATION, DECOMPOSITION, DETECTORS, HARMONICS, IDENTIFICATION, MEAN, MODELS, PARAMETERS, PROBABILITY, SIGNALS, STOCHASTIC PROCESSES, TIME.

AD-A219 937

AD-A219 937

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 936   12/9   22/1   AD-A219 934   5/8   12/5

CALIFORNIA UNIV LOS ANGELES DEPT OF ELECTRICAL   HARVARD UNIV CAMBRIDGE MA DEPT OF PSYCHOLOGY
ENGINEERING

(U) Theory of Filtering and Control With Application to   (U) DURIP - Computational Modeling of Cognitive Processes.
    Control of Large Space Structures.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-31 Oct 89.   DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89.

OCT 89   11P   MAR 90   5P

PERSONAL AUTHORS: Balakrishnan, A. V.   PERSONAL AUTHORS: Kosslyn, Stephen M.

CONTRACT NO.   AFOSR-88-0252   CONTRACT NO.   AFOSR-89-0090

PROJECT NO.   2304   PROJECT NO.   3842

TASK NO.   A1   TASK NO.   A4

MONITOR: AFOSR   MONITOR: AFOSR
          TR-90-0345   TR-90-0361

          UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

ABSTRACT: (U)   The problem of compensator design for co-   ABSTRACT: (U)   The equipment purchased under this grant
located sensors using continuum models of flexible   consisted of three VAX stations and two Macintosh II
multibody systems was solved. Several nonlinear damping   systems. The equipment was used by three major
models for general distributed parameter systems for beam   investigators and a large number of their graduate
models of flexible multibody systems were developed.   students for such purposes as speech analysis and
Keywords: Large space structures; Control theory. (edc)   synthesis and stimulus construction, connectionist
                                                            modeling of visual systems, experimentation and
                                                            perception, attention and memory, and the effects of
                                                            representational format on transfer effects in learning.
                                                            Nearly 20 publications resulted or are in press in
DESCRIPTORS: (U)   *FLEXIBLE STRUCTURES, *CONTROL THEORY,   addition to several presentations at national and
*SPACECRAFT, BEAMS(STRUCTURAL), BODIES, COMPENSATION,   international scientific meetings.
COMPENSATORS, DAMPING, DETECTORS, DISTRIBUTION, FILTERS,
MATHEMATICAL FILTERS, MATHEMATICAL MODELS, NONLINEAR   DESCRIPTORS: (U)   *COGNITION, *COMPUTATIONS,
SYSTEMS, PARAMETERS, SPACECRAFT COMPONENTS, THEORY.   *MATHEMATICAL MODELS, CONSTRUCTION, INTERNATIONAL,
                                                            LEARNING, PERCEPTION, SPEECH ANALYSIS, STIMULI, STUDENTS,
IDENTIFIERS: (U)   Colocated sensors, Large space   SYMPOSIA, SYNTHESIS, TRANSFER, VISION.
structures, PE61102F, WUAFOSR2304A1.
                                                            IDENTIFIERS: (U)   PE61102F, WUAFOSR3842A4.

AD-A219 938   AD-A219 934

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 930   12/1   12/3   5/1   AD-A219 930   CONTINUED

MISSOURI UNIV-COLUMBIA   COMPUTATIONS, CONFIDENCE LEVEL, HYPOTHESES, LOGIC,
                                              SEGMENTED, SIZES(DIMENSIONS), SOLUTIONS(GENERAL), TARGET
(U) Management of Uncertainty in Military Scene Analysis.   RECOGNITION, TEXTURE, VALUE.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-31 May 88.   IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A7.

JUL 88   98P

PERSONAL AUTHORS: Keller, James M.; Crownover, Richard M.;
McLaren, Robert W.

CONTRACT NO.   AFOSR-87-0226

PROJECT NO.   2304

TASK NO.   A7

MONITOR: AFOSR
           TR-90-0341

UNCLASSIFIED REPORT

ABSTRACT: (U)   Research into modeling and managing
uncertainty in military scene analysis is presented. A
new method of logical inference was developed for the
case where propositions are modeled by possibility
distributions. This scheme was tested in a prototype
fuzzy rule-based system for automatic target recognition.
An information fusion technique based on the fuzzy
integral was also developed. This was inserted into a
numeric uncertainty propagation ATR prototype system.
Fractal geometry was exploited for scene description and
segmentation. Results concerning dimension calculation,
texture description and segmentation, and surface
orientation from fractal features is presented. Fast
solutions to two problems in linear discriminant analysis
are contained herein. Both techniques avoid the
potentially disastrous errors from calculating large-
cross product matrices. Finally, preliminary work on
modifying confidence values for hypotheses based on
external or scene derived context are presented. Keywords:
Uncertainty; Fuzzy logic; Belief theory; Fuzzy integral;
Rule-based automatic target recognition; Fractal geometry;
Texture analysis; Linear discriminant analysis; Context.
(eg)

DESCRIPTORS: (U)   *DISCRIMINATE ANALYSIS, *LINEAR SYSTEMS,
*PROTOTYPES, *MANAGEMENT PLANNING AND CONTROL, AUTOMATIC,

AD-A219 930   AD-A219 930

AD-A219 929   12/5   2/6   AD-A219 927   6/4

MASSACHUSETTS UNIV AMHERST DEPT OF COMPUTER AND   CENTRAL INST FOR THE DEAF ST LOUIS MO
INFORMATION SCIENCE

(U) Intelligent, Real-Time Problem Solving.   (U) Auditory Perception of Complex Sounds.

DESCRIPTIVE NOTE: Final rept. 15 Sep-14 Dec 89,   DESCRIPTIVE NOTE: Final rept. 1 Sep 87-31 Dec 89,

  MAR 90   87P   MAR 90   3P

PERSONAL AUTHORS: Cohen, Paul; Hart, David M.   PERSONAL AUTHORS: Hirsh, Ira J.

CONTRACT NO.   F49620-89-C-0121   CONTRACT NO.   AFOSR-87-0382

PROJECT NO.   5581   PROJECT NO.   2313

TASK NO.   OO   TASK NO.   A6

MONITOR: AFOSR   MONITOR: AFOSR
            TR-90-0324   TR-90-0360

            UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

ABSTRACT: (U)   A testbed for intelligent, real-time
problem solving systems has been enhanced for use by the
broader research community. The testbed, part of the
Phoenix system, simulates forest fires and autonomous
agents who try to control them. Under this contract, the
testbed has been modularized for portability to other
researchers using Explorers or MicroExplorers.
Instrumentation has been added for experimentation and
baseline scenarios developed for typical real-time
problems found in this domain. A reference manual for the
testbed has been written. (JHD)

ABSTRACT: (U)   Experiments on auditory perception of
temporal interval, pitch, and timbre are outlined.
Reference to more detailed articles in press are provided.
Articles on auditory timing have appeared in Perception &
Psychophysics. Keywords: Scientific literature;
Periodicals; Military publications; Reports. (EG)

DESCRIPTORS: (U)   *ARTIFICIAL INTELLIGENCE, *FIRE
FIGHTING, *FOREST FIRES, *PROBLEM SOLVING, BASE LINES,
MANUALS, REAL TIME, SCENARIOS, TEST BEDS.

DESCRIPTORS: (U)   *AUDITORY PERCEPTION, *SOUND, MILITARY
PUBLICATIONS. SCIENTIFIC LITERATURE.

IDENTIFIERS: (U)   PE62702F, WUAFOSR558100.

IDENTIFIERS: (U)   WUAFOSR2313A6, PE61102F.

AD-A219 929   AD-A219 927

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 921   CONTINUED

AD-A219 921   12/3

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A5.

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC
PROCESSES

(U) M-Estimators in Linear Models with Long Range
Dependent Errors.

DESCRIPTIVE NOTE: Technical rept.,

FEB 90   24P

PERSONAL AUTHORS: Koul, Hira L.

REPORT NO.   TR-283

CONTRACT NO.   F49620-85-C-0144

PROJECT NO.   2304

TASK NO.   A5

MONITOR: AFOSR
TR-90-0326

UNCLASSIFIED REPORT

ABSTRACT: (U)   This note discusses the asymptotic
behavior of a class of M-estimators in linear models
which errors are Gaussian, or a function of Gaussian
random variables, that are long range dependent. The
asymptotics are discussed when the design variables are
either i.i.d. or long range dependent, independent of the
errors, or known constants. It is observed that the class
of M-estimators of the regression parameter vector
corresponding to skew symmetric scores and symmetric
errors asymptotically behave like the least squares
estimators. Moreover, in these cases, if the design
variables are either i.i.d. or known constants then the
limiting distributions are Normal. But if the design
variables are also long range dependent then the limiting
distributions are nonnormal. Keywords: Hermite rank and
polynomials. (kr)

DESCRIPTORS: (U)   *LINEARITY, *ESTIMATES, *MATHEMATICAL
MODELS, ASYMPTOTIC SERIES, DISTRIBUTION, ERRORS,
LIMITATIONS, LONG RANGE(DISTANCE), LONG RANGE(TIME),
PARAMETERS, POLYNOMIALS, RANK ORDER STATISTICS,
REGRESSION ANALYSIS, SCORING, SKEWNESS, SPECIAL
FUNCTIONS(MATHEMATICAL), SYMMETRY, RANDOM VARIABLES.

AD-A219 921

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 920   5/7

UNIVERSITY OF SOUTHERN CALIFORNIA MARINA DEL REY
INFORMATION SCIENCES INST

(U) Research in Knowledge Delivery.

DESCRIPTIVE NOTE: Final rept. Nov 86-Oct 89.

FEB 90   31P

PERSONAL AUTHORS: Hovy, Eduard H.

CONTRACT NO.   F49620-89-C-0021

PROJECT NO.   2304

TASK NO.   A7

MONITOR: AFOSR
            TR-90-0325

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report summarizes the research and
development work done over four years toward the goal of
automatically planning and generating fluent
multisentence paragraphs of English text. While ensuring
that the grammar is adequate to support the parsing of
English text. The work consisted of three principal
components, namely text structuring, parsing, and
knowledge representation. A theory of texture structure,
and an accompanying text planner, were developed and
successfully used to generate paragraphs in three
different application domains. To ensure bidirectionality,
tested on a functional grammar in to investigate the
an existing prototype parser was adapted and refined and
invertibility of the grammar. Knowledge representation
work focused on linking the generator with arbitrary
applications by developing a very general underlying
taxonomy of conceptual entities which can be linked with
various specific domain-related taxonomies. (kr)

DESCRIPTORS: (U)   *TEXT PROCESSING, ENGLISH LANGUAGE,
GRAMMARS, PARSERS, PROTOTYPES, TAXONOMY, THEORY.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A7.

AD-A219 920

AD-A219 919   5/3   5/8

YALE UNIV NEW HAVEN CT DEPT OF COMPUTER SCIENCE

(U) Integrated Incremental Case-Based Understanding and
Explanation: DMAP.

DESCRIPTIVE NOTE: Final rept. 1 Jun 87-31 May 88.

MAY 88   14P

PERSONAL AUTHORS: Schank, Roger C.

CONTRACT NO.   AFOSR-87-0295

PROJECT NO.   2304

TASK NO.   A7

MONITOR: AFOSR
            TR-90-0351

UNCLASSIFIED REPORT

ABSTRACT: (U)   We have the following goals for our
research with the direct memory access algorithm for
understanding and inference: a. using the DMA algorithm
to carry out larger scale case-based reasoning, b.
improving the robustness of the understander, c.
exploring issues in parallelizing the algorithm. In what
follows below, we will not make detailed reference to the
algorithm, except to distinguish the two basic components
of memory search - a. concept refinement, which goes from
an abstract memory structure and some components of it to
the most specific version of that memory structure that
contains those components, and b. concept reference,
which uses concept sequences to go from references to
certain component concepts to the larger concept that
contains those concepts. Concept refinement, for example,
goes from a communication event by Milton Friedman to
Milton Friedman's argument about interest rates. Concept
reference goes from interest rates, and soar to the
concept of rising interest rates. (kr)

DESCRIPTORS: (U)   *ALGORITHMS, *ACCESS, *REASONING,
MEMORY DEVICES, ECONOMICS, INTEGRATED SYSTEMS, SEARCHING.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A7.

AD-A219 919

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 908   5/8

CALIFORNIA UNIV SANTA BARBARA

(U) Hand Shaping: A Paradigm for Cognitive/Motoric Interaction.

DESCRIPTIVE NOTE: Final rept. 1 Jul 87-31 Dec 89,

FEB 90   6P

PERSONAL AUTHORS: Klatzky, Roberta L.; Pellegrino, James W.

CONTRACT NO.   AFOSR-87-0230

PROJECT NO.   2313

TASK NO.   A4

MONITOR: AFOSR
TR-90-0359

UNCLASSIFIED REPORT

ABSTRACT: (U)   The research efforts during the contract period resulted in three submitted or published papers and one doctoral dissertation. The papers reported: (i) a series of experiments demonstrating that activation of a hand-shape representation could facilitate subsequent judgements about actions on objects; (ii) an investigation of preshaping during responses to objects; and (iii) the development of a controlled object-display system to measure response time and movement time. The dissertation reported a series of experiments demonstrating that priming of a hand shape was disrupted by simultaneous preparation for a sequence of finger responses but not by preparation for a sequence of spoken syllables. In general, our results suggest a cognitive/motoric representation of the hand with which actions on objects can be internally modeled, and which may serve a preparatory role in performance.

DESCRIPTORS: (U)   *REACTION TIME, *COGNITION, ACTIVATION, FINGERS, HANDS, JUDGEMENT(PSYCHOLOGY), PREPARATION, RESPONSE, SEQUENCES, SHAPE, SYNCHRONISM, TIME.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2313A4.

AD-A219 908

AD-A219 905   6/4   5/8

NORTH DAKOTA STATE UNIV   FARGO DEPT OF ELECTRICAL AND ELECTRONICS ENGINEERING

(U)   DURIP-Instrumentation for Recording and Analyzing Multiple Input/Output Saccadic Eye Movement Neurosensory Control.

DESCRIPTIVE NOTE: Final technical rept. 1 Dec 88-30 Nov 89,

JAN 90   19P

PERSONAL AUTHORS: Enderle, John

CONTRACT NO.   AFOSR-89-0092

PROJECT NO.   3842

TASK NO.   A4

MONITOR: AFOSR
TR-90-0342

UNCLASSIFIED REPORT

ABSTRACT: (U)   To investigate multiple input-multiple output saccadic eye movement neurosensory control, both three-dimensional eye movement data are recorded and analyzed. The purpose of this grant is funding computer equipment for analysis of head and saccadic eye movement data, to describe the neurosensory control mechanism response from combined visual, auditory and vestibular stimuli during enhancement and inhibitory modes. The ultimate goal of this research is to enhance our understanding of how the brain integrates and controls neurosensory information. Data analysis is carried out in both the time and frequency domain. The system identification technique is used for parameter and control estimation from the data collected. Significant advances on eye rectus muscle model development and a neural network for saccades have been made. It should be noted that the use of the equipment purchased with this grant will continue in the future.

DESCRIPTORS: (U)   *EYE MOVEMENTS, *NEUROPHYSIOLOGY, BRAIN, COMPUTERS, CONTROL, DATA PROCESSING, ESTIMATES, EYE, FREQUENCY, IDENTIFICATION, INHIBITION, MODELS, MUSCLES, NEURAL NETS, STIMULI, THREE DIMENSIONAL, VESTIBULAR

AD-A219 905

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 905   CONTINUED

APPARATUS.

IDENTIFIERS: (U)   PE61102F, WUAFOSR3842A4, *Saccadic eye
movements.

AD-A219 904   20/7

TEXAS TECH UNIV LUBBOCK DEPT OF ELECTRICAL ENGINEERING

(U)   Experimental Testing of Corpuscular Radiation
Detectors.

DESCRIPTIVE NOTE: Final rept. 1 Dec 88-30 Nov 89,

MAR 90   4P

PERSONAL AUTHORS: Zieher, Klaus W.

CONTRACT NO.   AFOSR-89-0136

PROJECT NO.   3842

TASK NO.   A6

MONITOR: AFOSR
TR-90-0357

UNCLASSIFIED REPORT

ABSTRACT: (U)   The equipment purchased under this DURIP
grant is used in the Investigation of the Plasma Edge
Cathode Scheme in support of grant AFOSR-87-0154.
Keywords: Corpuscular radiation, High speed framing
camera assembly, Image scanner, RF-Enclosure.

DESCRIPTORS: (U)   *CORPUSCULAR RADIATION, *DETECTORS.
ASSEMBLY, CAMERAS, CATHODES, EDGES, IMAGES.
PLASMAS(PHYSICS), SCANNERS.

IDENTIFIERS: (U)   PE61104D, WUAFOSR3842A6.

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 897   5/9   AD-A219 896   5/2

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH   UNIVERSAL ENERGY SYSTEMS INC DAYTON OH

(U) United States Air Force Graduate Student Research   (U) United States Air Force Graduate Student Research
    Program. 1989 Program Technical Report. Volume 3.   Program. 1989 Program Management Report.

DESCRIPTIVE NOTE: Annual rept.,   DESCRIPTIVE NOTE: Annual rept.,

   DEC 89   363P   DEC 89   194P

PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.   PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.

CONTRACT NO. F49620-85-C-0013   CONTRACT NO. F49620-85-C-0013

PROJECT NO. 3396   PROJECT NO. 3396

TASK NO. D5   TASK NO. D5

MONITOR: AFOSR   MONITOR: AFOSR
          TR-90-0373   TR-90-0370

        UNCLASSIFIED REPORT   UNCLASSIFIED REPORT

ABSTRACT: (U) The Unites States Air Force Graduate
Student Research Program (USAF-GSRP) conducted under the
United Air Force Summer Faculty Research Program. The
program provides funds for selected graduate students to
work at an appropriate Air Force facility with a
supervising professor who holds a concurrent Summer
Faculty Research Program appointment or with a
supervising Air Force Engineer/Scientist. This is
accomplished by the students being selected on a
nationally advertised competitive basis for a ten-week
assignment during the summer intersession period to
perform research at Air Force laboratories/centers.

DESCRIPTORS: (U) *AIR FORCE PERSONNEL, *AIR FORCE   DESCRIPTORS: (U) *RESEARCH MANAGEMENT, AIR FORCE
RESEARCH, AIR FORCE FACILITIES, ENGINEERS, LABORATORIES,   RESEARCH, ABSTRACTS, RESEARCH FACILITIES, LABORATORIES.
SCIENTISTS, STUDENTS, SUMMER, GRADUATES.   AIR FORCE FACILITIES, STUDENTS, GRADUATES, WEAPONS,
                                                       AERONAUTICAL ENGINEERING, ASTRONAUTICS, ELECTRONICS.
IDENTIFIERS: (U) WUAFOSR3396D5, PE61102F   GEOPHYSICS, AVIONICS, AERODYNAMICS, MATERIALS, HUMAN
                                                       RESOURCES, MEDICINE, PROPULSION SYSTEMS.

                                                       IDENTIFIERS: (U) Air Force research laboratories.
                                                       WUAFOSR3396D5, PE61102F.

AD-A219 897   AD-A219 896

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 895   15/1   AD-A219 895   CONTINUED

UNIVERSAL ENERGY SYSTEMS INC DAYTON OH   across the country. This four volume document is a
                                            compilation of the final reports written by the assigned
(U) United States Air Force Summer Faculty Research   faculty members about their summer research efforts. (kr)
     Program. 1989 Program Management Report.
                                            DESCRIPTORS: (U)   *AIR FORCE RESEARCH, *RESEARCH
DESCRIPTIVE NOTE: Annual rept.,   MANAGEMENT, AIR FORCE, AIR FORCE FACILITIES, AIR FORCE
                                            SYSTEMS COMMAND, COMPENSATION, COSTS, INSTRUCTORS,
    DEC 89   292P   LABORATORIES, PRODUCTIVITY.

PERSONAL AUTHORS: Darrah, Rodney C.; Espy, Susan K.   IDENTIFIERS: (U)   WUAFOSR3396D5, PE61102F.

CONTRACT NO.   F49620-85-C-0013

PROJECT NO.   3396

TASK NO.   D5

MONITOR: AFOSR
            TR-90-0365

            UNCLASSIFIED REPORT

ABSTRACT: (U)   The United States Air Force Summer Faculty
Research Program (USAF-SFRP) is designed to introduce
university, college, and technical institute faculty
members to Air Force research. This is accomplished by
the faculty members being selected on a nationally
advertised competitive basis for a ten-week assignment
during the summer intersession period to perform research
at Air Force laboratories/centers. Each assignment is in
a subject area and at an Air Force facility mutually
agreed upon by the faculty members and the Air Force. In
addition to compensation, travel and cost of living
allowances are also paid. The USAF-SFRP is sponsored by
the Air Force Office of Scientific Research, Air Force
Systems Command, United States Air Force, and is
conducted by Universal Energy Systems, Inc. The specific
objectives of the 1989 USAF-SFRP are: (1) To provide a
productive means for U.S. faculty members to participate
in research at Air Force Laboratories/Centers; (2) To
stimulate continuing professional association among the
faculty and their professional peers in the Air Force; (3)
To further the research objectives of the United States
Air Force; and (4) To enhance the research productivity
and capabilities of the faculty especially as these
relate to Air Force technical interests. During the
summer of 1989, 168-faculty members participated. These
researchers were assigned to 23 USAF laboratories/centers

AD-A219 895   AD-A219 895

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 877   12/5

CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB

(U) Numerical Optimization, System Theoretic and Software
Tools for the Integrated Design of Flexible Structures
and their Control Systems.

DESCRIPTIVE NOTE: Final rept. 30 Sep 86-29 Sep 89.

FEB 90   10P

PERSONAL AUTHORS: Polak, Elijah

CONTRACT NO.   AFOSR-86-0116

PROJECT NO.   2304

TASK NO.   A1

MONITOR: AFOSR
TR-90-0339

UNCLASSIFIED REPORT

ABSTRACT: (U)   The research covered by this report was
aimed at developing a broad, optimization-based
methodology for use in computer-aided-design of
engineering systems. To this end, research was carried
out in the following areas: (i) the development of a
theory which can be used as a general guide in the
construction of semi-infinite optimization, shape
optimization and optimal control algorithms; (ii) the
development of various new semi-infinite optimization and
optimal control algorithms; (iii) the development of
techniques for formulating system stability and worst-
case requirements as well-conditioned semi-infinite
inequalities; (iv) the exploration of the use of
optimization in the design of control systems; and
finally, (v) interactive software for optimization-based
control system design. (kr)

DESCRIPTORS: (U)   *COMPUTER AIDED DESIGN, *SYSTEMS
ENGINEERING, OPTIMIZATION, COMPUTER PROGRAMMING, FLEXIBLE
STRUCTURES, CONTROL SYSTEMS, INTEGRATED SYSTEMS,
INTERACTIONS.

AD-A219 877

AD-A219 878   12/1

NEW YORK UNIV NY COURANT INST OF MATHEMATICAL SCIENCES

(U) Diffraction Patterns and Vortex Rollup.

DESCRIPTIVE NOTE: Final rept. 1 Nov 87-31 Oct 89.

OCT 89   9P

PERSONAL AUTHORS: Glimm, J.

CONTRACT NO.   AFOSR-88-0025

PROJECT NO.   2304

TASK NO.   A3

MONITOR: AFOSR
TR-90-0335

UNCLASSIFIED REPORT

ABSTRACT: (U)   The three main developments concern:
Riemann problems and nonlinear wave interactions for real
materials, including material strength properties;
Riemann problems and chaotic mixing for conversation laws
in general; an Development of three dimensional and
parallel processing front tracking algorithms. (JHD)

DESCRIPTORS: (U)   *DIFFRACTION ANALYSIS, *PARALLEL
PROCESSING, INTERACTIONS, MATERIALS, NONLINEAR SYSTEMS,
MIXING, PATTERNS, STRENGTH(MECHANICS), WAVES, VORTICES,
TRACKING.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A3, Front tracking,
Riemann problems.

AD-A219 876

PAGE   128   EVK11C

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 875   12/9

NORTHWESTERN UNIV EVANSTON IL

(U) Memory-Based Expert Systems.

DESCRIPTIVE NOTE: Final rept. 1 Nov 88-30 Jun 89.

JUN 89   5P

PERSONAL AUTHORS: Schank, Roger C.

CONTRACT NO.   AFOSR-89-0100

PROJECT NO.   6101

TASK NO.   00

MONITOR: AFOSR
TR-90-0346

UNCLASSIFIED REPORT

ABSTRACT: (U)   The purpose of this project was to explore new possibilities for representation and retrieval of knowledge. Building on our work in knowledge representation and memory organization, we built alternatives to the rule-based approach to expert systems. We tried instead to model the powerful capacity people have to generalize their knowledge across numerous domains. We believe that our explanation in this area will lead to flexible and robust methods for creating automated reasoning and problem-solving systems. Keywords: Artificial intelligence; Expert systems. (kt)

DESCRIPTORS: (U)   *ARTIFICIAL INTELLIGENCE, *PROBLEM SOLVING, AUTOMATION, MEMORY DEVICES, REASONING.

IDENTIFIERS: (U)   PE61101F, WUAFOSR610100, *Expert systems, Automated reasoning.

AD-A219 875

AD-A219 874   20/12

ARIZONA STATE UNIV TEMPE CENTER FOR SOLID STATE ELECTRONICS RESEARCH

(U) Hot Carrier in Subpicosecond Photoconductive Experiments.

DESCRIPTIVE NOTE: Final rept. 1 Sep 84-31 Mar 89.

FEB 90   17P

PERSONAL AUTHORS: Grondin, Robert O.

CONTRACT NO.   AFOSR-84-0290

PROJECT NO.   2305

TASK NO.   C1

MONITOR: AFOSR
TR-90-0349

UNCLASSIFIED REPORT

ABSTRACT: (U)   The goal of this program was the development and use of models of femtosecond photoconductive experiments as probes of hot carrier transport in semiconductors. Prototype experiments were being carried out in a companion effort directed by Dr. Gerald Mourou at the University of Rochester, Rochester, New York. The Arizona State University modeling effort was directed at several main components to the modeling of such experiments. One must first model the generation of electron-hole pairs inside a semiconductor as a result of the incidence of a femtosecond optical pulse. Then one must model the processes by which the resulting current transient is developed. Lastly, the conversion of the current transient into a voltage wave transmitted down a transmission line must be understood. It is this voltage wave that is directly measured in the experiments of interest. Successful models of all three components were developed. (rrh)

DESCRIPTORS: (U)   *CHARGE CARRIERS, *PHOTOCONDUCTIVITY, *SEMICONDUCTORS, *TRANSPORT PROPERTIES, CONVERSION, ELECTRONS, EXPERIMENTAL DATA, HIGH ENERGY, HOLES(ELECTRON DEFICIENCIES), LIGHT PULSES, MODELS, PROTOTYPES, TRANSMISSION LINES, VOLTAGE, WAVES.

AD-A219 874

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 873   12/6

TEXAS TECH UNIV LUBBOCK DEPT OF ELECTRICAL ENGINEERING

(U) Outer Product Processor Using Polarization Encoding.

DESCRIPTIVE NOTE: Rept. for Dec 87-Dec 88.

JAN 90   10P

PERSONAL AUTHORS: Ittycheriah, Abraham P.; Walkup, John F.
; Krile, Thomas F.; Lim, Song L.

CONTRACT NO.   AFOSR-88-0064

PROJECT NO.   2305

TASK NO.   B1

MONITOR: AFOSR
TR-90-0353

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Optics, v29 n2 p275-
283, 10 Jan 90.

ABSTRACT: (U)   An architecture capable of performing the
outer product operation followed by a weighting of the
resultant elements is presented in this paper. By using a
polarization encoding technique, the spatial capacity is
increased by a factor of four over implementations using
other techniques. The use of space-integrating
photodiodes as detectors permits the evaluation of second-
order polynomials. Spatial multiplexing allows the
architecture greater versatility in performing a large
number of operations in parallel. The primary application
here using this architecture is a quadratic neural
network. Keywords: Optical computing; Polarization
encoding; Outer product processing; Optical neural
networks. (JHD)

DESCRIPTORS: (U)   *CODING, *NEURAL NETS, *OPTICAL
PROCESSING, *POLARIZATION, *COMPUTER ARCHITECTURE,
CAPACITY(QUANTITY), COMPUTATIONS, OPTICAL DETECTORS,
MULTIPLEXING, OPERATION, OPTICAL PROPERTIES, PROCESSING
EQUIPMENT, QUADRATIC EQUATIONS, SPATIAL DISTRIBUTION.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2305B1.

AD-A219 873

PAGE   130   EVK11C

AD-A219 874   CONTINUED

IDENTIFIERS: (U)   PE61102F, WUAFOSR2305C1.

AD-A219 874

AD-A219 872   20/5

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Intermolecular Forces, Spontaneous Emission, and
Superradiance in a Dielectric Medium: Polariton-
Mediated Interactions,

DEC 89   17P

PERSONAL AUTHORS: Knoester, Jasper; Mukamel, Shaul

CONTRACT NO. AFOSR-90-0054

PROJECT NO. 2303

TASK NO. B3

MONITOR: AFOSR
TR-90-0347

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Publ. in Physical Review A, v40 n12
p7065-7080, 15 Dec 89.

ABSTRACT: (U) A reduced equation of motion which
describes the excited state dynamics of interacting two-
level impurity molecules in a dielectric host crystal is
derived starting from a microscopic model for the total
system. Our theory generalizes the derivation of the
conventional superradiance master equation for molecules
in vacuum; the role of photons in the conventional theory
is played by polaritons (mixed crystal-radiation
excitations) in our approach. Our final equation thus
contains dispersive and superradiant polariton-mediated
intermolecular interactions. The effect of the dielectric
host is completely contained within a rescaling of these
interactions with the transverse dielectric function
Epsilon (omega) of the crystal taken at the impurity's
transition frequency. Our theory yields all local field
and screening factors for both the dispersive and the
dissipative couplings from a single, unified starting
point. Known scaling laws for the spontaneous emission
rate and the instantaneous dipole-dipole interaction are
extended to the frequency region where the dispersion of
Epsilon (omega) is important. Keywords: Intermolecular
forces; Spontaneous emission; superradiance; Polariton
mediated interactions. Reprints. (jhd)

AD-A219 872   CONTINUED

DESCRIPTORS: (U) *EMISSION SPECTRA, *MOLECULAR
SPECTROSCOPY, *RADIANCE, COUPLINGS, CRYSTALS, DIELECTRIC
PROPERTIES, DIELECTRICS, DISSIPATION, EQUATIONS OF MOTION,
FREQUENCY BANDS, IMPURITIES, INTERACTIONS, MICROSCOPY,
MODELS, PHOTONS, RATES, REDUCTION, REPRINTS, SCALING
FACTOR, THEORY, TRANSITIONS, TRANSVERSE, VACUUM.

IDENTIFIERS: (U) Radiance, Polaritons, Spontaneous
emissions, PE61102F, WUAFOSR2303B3.

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 870   6/4   6/15

NOVA PHARMACEUTICAL CORP BALTIMORE MD

(U) Regulation of Neurotransmitter Responses in the
Central Nervous System.

DESCRIPTIVE NOTE: Final rept. 15 May 87-14 May 89,

FEB 90   59P

PERSONAL AUTHORS: Ferkany, John W.; Enna, S. J.

CONTRACT NO.   F496290-87-C-0071

PROJECT NO.   2312

TASK NO.   A2

MONITOR: AFOSR
          TR-90-0364

          UNCLASSIFIED REPORT

ABSTRACT: (U)   Gamma-Aminobutyric acid (GABA) is a key
inhibitory neurotransmitter in the mammalian central
nervous system. Two major categories of receptors, termed
GABA(A) and GABA(B) are activated by the amino acid.
Whereas GABA(A) receptors appear to be directly involved
in synaptic transmission, GABA(B) receptors may function
as neuromodulatory sites. Baclofen (BAC), a GABA(B)
agonist has been shown to have multiple effects on
stimulus-evoked increases in second messenger production.
For example, BAC augments cAMP formation in the presence
of catecholamines but inhibits the response evoked by the
direct adenylate cyclase activator, forskolin. Results
from the current study have demonstrated the presence of
these GABA(B) effects in several mammalian species
suggesting a broad physiological relevance. Using a
variety of different pharmacophores, evidence is
presented supporting the notion that the augmenting and
inhibitory efforts of GABA(B) agonists are mediated
through pharmacologically distinct reports. Finally, the
augmenting response does not appear to be mediated
through protein kinase C. However, BAC may facilitate
second messenger production by alerting the coupling of
catecholamine receptor to G-proteins involved in the cAMP
cascade. (kt)

DESCRIPTORS: (U)   *CATECHOLAMINES, *INHIBITION, *NERVE

AD-A219 870

AD-A219 870   CONTINUED

TRANSMISSION, *SYNAPSE, ACTIVATION, ADENYL CYCLASE, AMINO
ACIDS, BUTYRIC ACIDS, CENTRAL NERVOUS SYSTEM, CONTROL,
FACILITES, MAMMALS, RESPONSE, SENSE ORGANS,
TRANSMITTANCE.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2312A2, GABA(Gamma
Aminobutyric Acids), Receptor sites, Binding sites,
Active sites.

AD-A219 848   12/5

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) Deductive Computer Programming. Revision.

DESCRIPTIVE NOTE: Final rept. 1 Aug 88-30 Sep 89.

SEP 89   9P

PERSONAL AUTHORS: Manna, Zohar

CONTRACT NO.   AFOSR-88-0281

PROJECT NO.   2304

TASK NO.   A2

MONITOR: AFOSR
            TR-90-0333

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Revision of rept. dated 28 Feb 88, AD-A216 670.

ABSTRACT: (U)   In an effort to make the research accessible to a wider audience besides the scholarly journals, the PI has published two volumes of the book 'The Logical Basis of Computer Programming'. This book requires only an intuitive understanding of sets, relations, functions, and numbers. Despite the elementary approach, the text presents some novel research results, including: theories of strings, trees, lists and finite sets which are particularly suited to theorem-proving and program-synthesis applications; formalization of parsing; a nonclausal version of skolemization; a treatment of mathematical induction in the deductive-tableau framework. The implemented tableau system combines features lacking elsewhere such as producing proofs by mathematical inducing. (SDW)

DESCRIPTORS: (U)   *COMPUTER PROGRAMMING, INDUCTION SYSTEMS, MATHEMATICS, PARSERS, SET THEORY, THEORY, TREES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2304A2.

AD-A219 848

AD-A219 859   9/1

TEXAS UNIV AT AUSTIN MICROWAVE LAB

(U) Monolithic Phase Shifter Study.

DESCRIPTIVE NOTE: Final technical rept. Nov 85-Oct 88,

FEB 90   55P

PERSONAL AUTHORS: Neikirk, D. P.; Itoh, T.

REPORT NO.   MW-90-P-1

CONTRACT NO.   AFOSR-86-0036

PROJECT NO.   2305

TASK NO.   C1

MONITOR: AFOSR
            TR-90-0343

UNCLASSIFIED REPORT

ABSTRACT: (U)   Modeling and testing of monolithic coplanar waveguide (CPW) phase shifters using both optical and Schottky-contact control techniques have been performed. Simulation work on a periodically illuminated structure has been completed, showing that some improvement in performance may be possible, although with a reduction in frequency bandwidth. CPW transmission lines have been fabricated on semi-insulating GaAs, on lightly and heavily doped epi GaAs, and on AlGaAs/GaAs heterostructure, and electrical characterization has been performed. Both Schottky-bias controlled mechanism, using constant D.C. bias while using optical control has also been developed, which has yielded the best experimental performance to date for a distributed CPW phase shifter. (rrh)

DESCRIPTORS: (U)   *MONOLITHIC STRUCTURES(ELECTRONICS), *PHASE SHIFT CIRCUITS, BANDWIDTH, CONTROL, FREQUENCY, ILLUMINATION, METHODOLOGY, OPTICAL PROPERTIES, OPTICS, SIMULATION, TRANSMISSION LINES.

IDENTIFIERS: (U)   PE61102F, WUAFOSR2305C1.

AD-A219 859

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 840   21/2

CALIFORNIA UNIV IRVINE DEPT OF MECHANICAL ENGINEERING

(U) Fundamental Studies on Spray Combustion and Turbulent Combustion.

DESCRIPTIVE NOTE: Final rept. 1 Nov 86-31 Oct 89,

JAN 90   160P

PERSONAL AUTHORS: Sirignano, W. A.; Samuelsen, G. S.;
Rangel, R. H.; Chiang, C.-H.; Stapper, B. E.

CONTRACT NO.   AFOSR-86-0018

PROJECT NO.   2308

TASK NO.   A2

MONITOR: AFOSR
TR-90-0355

UNCLASSIFIED REPORT

ABSTRACT: (U)   Four major tasks are described: An
atomization experiment, an atomization analysis, a
turbulent reactive flow analysis, and a vaporizing
droplet analysis. The atomization theoretical and
experimental studies consider the nonlinear distortion of
a planar liquid fuel stream. Various modes of surface
instabilities are identified and analyzed in detail.
Critical values of parameters related to surface tension,
stream velocities, disturbance wavelength, stream
densities, and liquid stream thickness are identified as
the separation between stable and unstable interfaces.
Measurements of the resulting spray characteristics are
also presented. The analysis for turbulent reactive flows
emphasizes molecular mixing and chemical reaction within
a vortical structure. Isolated vortices are examined. The
vortices are at the interface between two flows of
different composition. Probability density functions (pdf)
and concentration and velocity profiles are determined
and compared to existing experimental data. Temporally-
developing and spatially-developing mixing layers are
simulated. Merging and pairing of vortices is shown to be
the major entrainment mechanism. The larger values of the
pdf on the high-speed-stream side of the simulated mixing
layer agree with experiment but are shown to be caused by
a velocity bias rather than by larger mixing rates. The

AD-A219 840   CONTINUED

study of vaporizing droplets involves Navier-Stokes
solution for the axisymmetric flow around and within fuel
droplets. (aw)

DESCRIPTORS: (U)   *COMBUSTION, ATOMIZATION, AXISYMMETRIC
FLOW, BIAS, CHEMICAL REACTIONS, DENSITY, DISTORTION,
DROPS, ENTRAINMENT, EXPERIMENTAL DATA, FLOW, FREQUENCY,
FUELS, INTERFACES, INTERFACIAL TENSION, ISOLATION, LAYERS,
LIQUIDS, MIXING, MOLECULES, NAVIER STOKES EQUATIONS,
NONLINEAR SYSTEMS, PLANAR STRUCTURES, PROBABILITY DENSITY
FUNCTIONS, PROFILES, RATES, REACTION KINETICS,
REACTIVITIES, SIMULATION, SOLUTIONS(GENERAL), SPRAYS,
STABILITY, STREAMS, THEORY, THICKNESS, TURBULENCE,
TURBULENT FLOW, VELOCITY, VORTICES.

IDENTIFIERS: (U)   WUAFOSR2308A2, PE61102F.

AD-A219 838   11/1   11/2   11/4

ILLINOIS UNIV AT URBANA DEPT OF CIVIL ENGINEERING

(U) Center for Cement Composite Materials.

DESCRIPTIVE NOTE: Final rept. 29 Oct 86-30 Nov 89,

JAN 90   70P

PERSONAL AUTHORS: Young, J. F.

CONTRACT NO.   F49620-87-C-0023

PROJECT NO.   3484

TASK NO.   A3

MONITOR: AFOSR
TR-90-0329

UNCLASSIFIED REPORT

ABSTRACT: (U)   The Center has produced very strong MDF
cements and has made significant progress in enhancing
the water resistance of the material. The important
factors in controlling water sensitivity have now been
identified and studies are in progress to quantify their
influences. Cement hydration has been followed by a novel
in-situ technique involving nuclear magnetic resonance.
Fiber-matrix interactions in MDF laminates were also
studied. Characterization of DSP pastes have shown that
the matrix is microporous; mesopores are absent unless
the material is allowed to dry out. This results in water
adsorption at low relative humidities, which adversely
impacts on electrical properties. DSP plates are a good
insulating, low dielectric material as long as it is kept
dry. Hydration under autoclaving conditions may be a way
of solving the problem and hydration chemistry at various
temperatures have been studied. The Center has also
studied a magnesium triphosphate cement, as a precursor
to polyphosphate cements and is exploring inorganic-
polymer composites at the molecular levels. Finally the
Center has investigated the influence of packing and
particle interactions on the rheology of suspensions with
high solids contents. The Center also established and
maintains a facility for the characterization of powders
and porous materials. (aw)

DESCRIPTORS: (U)   *CEMENTS, *COMPOSITE MATERIALS.

AD-A219 838

AD-A219 839   13/3

PUERTO RICO UNIV MAYAGUEZ

(U) Analytical Study of Concrete Pavement Behavior.

DESCRIPTIVE NOTE: Final rept.,

DEC 89   160P

PERSONAL AUTHORS: Agrait, Leandro R.; Rios, Benjamin C.

CONTRACT NO.   F49620-88-C-0133

PROJECT NO.   2302

TASK NO.   C2

MONITOR: AFOSR
TR-90-0330

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All
DTIC/NTIS reproductions will be in black and white.

ABSTRACT: (U)   This report presents research undertaken
to develop a methodology to study concrete pavement
behavior under dead load, temperature and a moving
dynamic vehicle. The methodology developed considers
concrete crack formation and corresponding stiffness
degradation, soil nonlinear behavior and failure theory,
vehicle vibration and velocity effect and the pavement
roughness. The results obtained with the methodology
could not be compared with other results because there is
not any other comparable tools available, but the general
behavior obtained seemed very logical for all the cases
studied. From the examples studied it can be concluded
that there is not an increase on dynamic response with an
increase in the random generated roughness amplitude.
Also, for the slab studied there is a decrease in the
magnitude of the dynamic response with an increase in
vehicle velocity. (aw)

DESCRIPTORS: (U)   *CONCRETE, AMPLITUDE, BEHAVIOR, CRACKS,
DEGRADATION, DYNAMIC RESPONSE, DYNAMICS, FAILURE, MOTION,
NONLINEAR SYSTEMS, PAVEMENTS, ROUGHNESS, SOIL MECHANICS,
STIFFNESS, THEORY, TOOLS, VEHICLES, VELOCITY, VIBRATION.

IDENTIFIERS: (U)   WUAFOSR2302C2.

AD-A219 839

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 838   CONTINUED

AD-A219 835   5/8

STANFORD UNIV CA

(U) Acquiring Generalizations to Organize Human Databases.

DESCRIPTIVE NOTE: Annual rept. Sep 88-Sep 89.

ADSORPTION, AUTOCLAVES, CHEMISTRY, DIELECTRICS, FIBERS,
HUMIDITY, HYDRATION, INSULATION, INTERACTIONS, LAMINATES,
LOW HUMIDITY, MATRIX MATERIALS, MOLECULES, NUCLEAR
MAGNETIC RESONANCE, PACKAGING, PARTICLES, POROUS
MATERIALS, POWDERS, RESISTANCE, RHEOLOGY, SENSITIVITY,
SOLIDS, WATER, INTERACTIONS.

FEB 90   16P

PERSONAL AUTHORS: Clapper, John P.; Bower, Gordon H.

CONTRACT NO.   AFOSR-87-0282

IDENTIFIERS: (U)   WUAFOSR3484A3, PE61103F.

PROJECT NO.   2313

TASK NO.   A4

MONITOR: AFOSR
TR-90-0363

UNCLASSIFIED REPORT

ABSTRACT: (U)   This report describes a program of
empirical and theoretical research on how category-level
generalizations facilitate human performance in learning
tasks, especially when the categories are acquired in an
unsupervised environment. An information-processing model
is described in which people are assumed to spontaneously
search for patterns and regularities among the training
instances, and use them as a basis for forming general
concepts. These concepts, in turn, enable learners to
economize their encoding of further instances by focusing
selectively on their most informative features. The
resulting memory organization appear to optimize later
access to the information from long-term memory. Several
memory experiments are described which provide strong
support for these claims. Two similarity experiments are
also reported; these demonstrate that concept learning
affects the evaluation and judgement of training
instances as predicted by our theory, specifically, that
comparison are strongly affected by the informative
(surprising or unusual) features of the objects being
compared. We also introduce a new procedure for observing
the spontaneous acquisition of concepts in an
unsupervised task. This task provides a trial-by-trial
index of the strength of subjects' default
generalizations about the concept. Keywords: Attention;
Mental model; Concepts/categories; Unsupervised learning;
Memory encoding; Memory retrieval. (KT)

AD-A219 835

AD-A219 838

PAGE   136   EVK11C

DTIC REPORT BIBLIOGRAPHY   SEARCH CONTROL NO. EVK11C

AD-A219 835   CONTINUED

DESCRIPTORS: (U) *LEARNING, *MEMORY(PSYCHOLOGY), ACCESS.
ACQUISITION, CODING, DATA BASES, HUMANS, INFORMATION
PROCESSING, INFORMATION RETRIEVAL, MEMORY DEVICES,
ARTIFICIAL INTELLIGENCE, MENTAL ABILITY, MODELS,
PERFORMANCE(HUMAN), RETENTION(PSYCHOLOGY).

IDENTIFIERS: (U) WUAFOSR2313A4, PE61102F.

AD-A219 834   21/2

PENNSYLVANIA STATE UNIV UNIVERSITY PARK

(U) Premixed Turbulent Flame Propagation.

DESCRIPTIVE NOTE: Final rept. 1 Nov 86-31 Oct 89,

FEB 90   15P

PERSONAL AUTHORS: Santavicca, D. A.

CONTRACT NO.   AFOSR-87-0097

PROJECT NO.   2308

TASK NO.   A2

MONITOR: AFOSR
TR-90-0352

UNCLASSIFIED REPORT

ABSTRACT: (U)   The results of an experimental study of
turbulence-flame interactions and their effect on
turbulent flame propagation are reported. Experiments are
conducted in a new turbulent flow system which is capable
of producing relative turbulence intensities as high as
100 percent. Using a freely propagating, one-dimensional
flame configuration, measurements are made using LDV of
the mean velocity, turbulence intensity, integral time
scale, energy spectrum, Reynolds stress, and integral
length scale, at a fixed location both before and after
flame arrival. A complete set os such measurements has
been made at one operating condition which characterize
both the magnitude of flame generated turbulence and its
anisotropic nature. The freely propagating, one
dimensional flame configuration has also been used to
study the effect of turbulence on turbulent flame
structure. Two dimensional Mie scattering is used to
obtain a two-dimensional slice of the turbulent flame
surface. Such measurements have been made at 15 different
conditions over very broad range of turbulence Reynolds
and Damkohler numbers and have been analyzed to determine
the fractal nature of the turbulent flame surface. The
results of these measurements show that premixed
turbulent flame surfaces are fractal throughout the
reaction sheet regime. Keywords: Premixed turbulent
combustion; Turbulent flame interactions; Turbulent flame
propagation; Turbulent flame structure. (JHD)

AD-A219 834

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 834   CONTINUED

DESCRIPTORS: (U) *COMBUSTION STABILITY, *FLAME
PROPAGATION, *TURBULENCE, COMBUSTION, CONFIGURATIONS,
FLAMES, INTENSITY, INTERACTIONS, MIE SCATTERING, MIXING,
MOMENTUM TRANSFER, ONE DIMENSIONAL, POSITION(LOCATION),
RESPONSE, SHEETS, SPECTRA, STRESSES, SURFACES, TIME,
TURBULENT FLOW, TWO DIMENSIONAL, VELOCITY.

IDENTIFIERS: (U) WUAFOSR2308A2, PE61102F, Damkohler
number.

AD-A219 826   9/6

CALIFORNIA UNIV IRVINE DEPT OF ELECTRICAL ENGINEERING

(U) Integrated Acoustooptic Device Modules for Optical
Information Processing.

DESCRIPTIVE NOTE: Final rept. 1 Sep 85-30 Sep 89,

SEP 89   18P

PERSONAL AUTHORS: Tsai, Chen S.

CONTRACT NO.   AFOSR-85-0378

PROJECT NO.   2305

TASK NO.   B1

MONITOR: AFOSR
            TR-90-0338

UNCLASSIFIED REPORT

ABSTRACT: (U)   General objectives of this research are
conception, experimentation and realization of new and
novel guided-wave AC device modules in LiNbO3 and GaAs
with applications to wideband multichannel optical
information processing, and study of relevant physical
mechanisms. This report presents the major
accomplishments that were made in the last program year.
These include: 1) Realization of single-mode TIPE
microlenses and lens arrays in LiNbO3 waveguide and high-
packing density multichannel integrated optic modules; 2)
In-depth analysis on guided-wave acoustooptic bragg
diffraction in ZnO-GaAs composite waveguides; 3)
Realization of high-performance GaAs guided-wave
acoustooptic Bragg Cells at GHz frequencies; and 4)
Formation of microlenses and lens array in GaAs waveguide
using ion milling. Keywords: TIPE(Titanium Indiffusion
Proton Exchange); Lithium niobates; Acoustooptics; Zinc-
oxide gallium-arsenide composite waveguides; Modules
electronics. (edc)

DESCRIPTORS: (U) *ACOUSTOOPTICS, *OPTICAL PROCESSING,
*WAVEGUIDES, ARRAYS, CHEMICAL MILLING, EXCHANGE,
COMPOSITE STRUCTURES, DIFFRACTION, GALLIUM ARSENIDES,
HIGH DENSITY, ION BEAMS, LENS ANTENNAS, LENSES, LITHIUM
NIOBATES, MODULES(ELECTRONICS), MULTICHANNEL, OPTICAL
DATA, PACKING DENSITY, PHYSICAL PROPERTIES, PROTONS.

AD-A219 826

AD-A219 834

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVK11C

AD-A219 825   5/2   7/3   11/9

DENVER UNIV CO

(U) Informal Conference on the Chemistry of Energetic
     Azides, Isocyanates, and Related Species Held in
     Denver, Colorado on 27-28th April 1989.

DESCRIPTIVE NOTE: Final rept. for period ending 1 Nov 88.

FEB 90   44P

PERSONAL AUTHORS: Coombe, Robert D.

CONTRACT NO.   AFOSR-89-0018

MONITOR: AFOSR
            TR-90-0348

UNCLASSIFIED REPORT

ABSTRACT: (U)   The Informal Conference on the Chemistry
of Energetic Azides, Isocyanates, and Related Species was
held on the 27th and 28th of April, 1989, at the Phipps
Conference Center of the University of Denver. The
Conference was attended by 40 persons from academia,
industry and government. 20 papers were presented on
dissociation dynamics, spectroscopy and theory, and
reactions of energetic azides and isocyanates. Keywords:
Azides; Isocyanates; Nitrenes; High energy materials;
Lasers; Spectroscopy; Photochemistry; Reactions. (EG)

DESCRIPTORS: (U) *AZIDES, *ISOCYANATES, *SYMPOSIA,
CHEMISTRY, DISSOCIATION, DYNAMICS, ENERGETIC PROPERTIES.
HIGH ENERGY, INDUSTRIES, LASERS, MATERIALS, ORGANIC
NITROGEN COMPOUNDS, PHOTOCHEMICAL REACTIONS. SPECTROSCOPY

AD A219 825   CONTINUED

TITANIUM, ZINC OXIDES.

IDENTIFIERS: (U)   TIPE(Titanium Indiffusion Proton
exchange), Microlens arrays, Integrated optics, Bragg
diffraction, Composite waveguides. Proton exchange, Ion
milling, PEGIIO3F, RUAFOSR2305B1.